

**ARCHITECTURE DEPARTMENT**

**CHINESE UNIVERSITY OF HONG KONG**

MASTER OF ARCHITECTURE PROGRAMME 1996-97

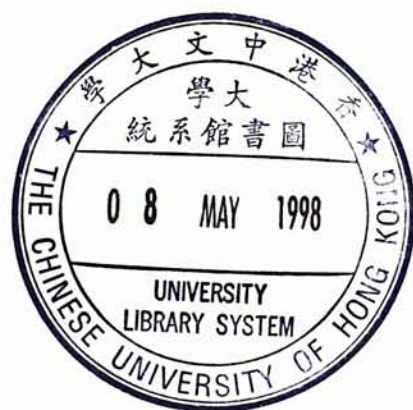
DESIGN REPORT



## **EXPERIMENTAL HOUSING IN TAI O**

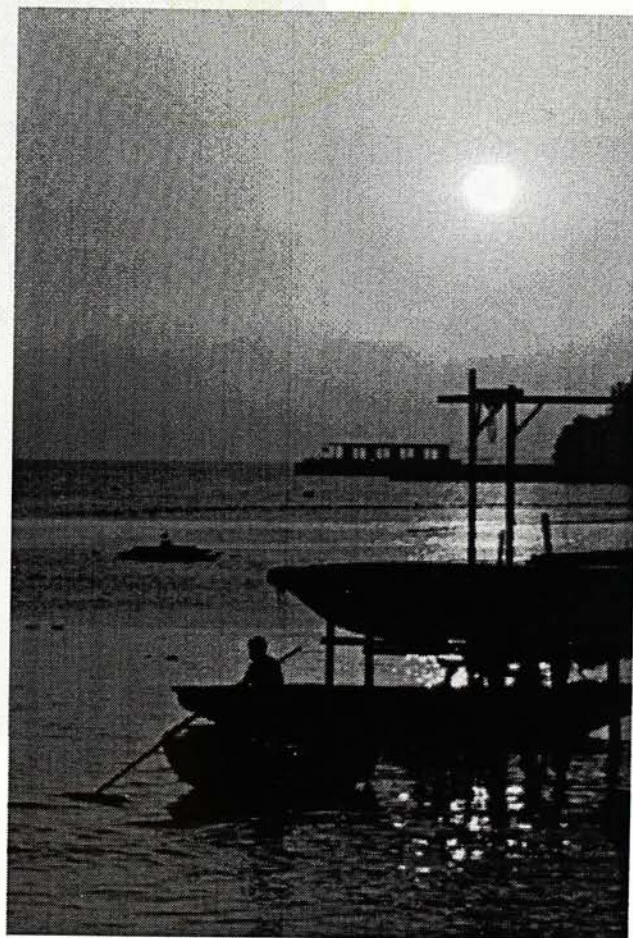
LEE Yee Chak Raymond

April 1997



## Design Report

Student Name : Lee Yee Chak Raymond  
 Student number: 95081100  
 Course: Master of Architecture  
 Instructor: Prof. Stephen Haughton  
 Professor,  
 Department of Architecture, C.U.H.K.  
 2nd. Tutor: Mr Freeman Chen  
 Lecturer,  
 Department of Architecture, C.U.H.K.



## **Content**

### **1. Introduction**

- 1.1 Design Objectives
- 1.2 Problem Defined
- 1.3 Description of Client & Users
- 1.4 Mission and Goals

### **2. Project Analysis**

- 2.1 Site / Context Analysis
  - 2.1.1 Location
  - 2.1.2 Climate
  - 2.1.3 Special Studies: Natural Ventilation
  - 2.1.4 History -- Sequence of the Settlement
  - 2.1.5 Development of Tai O
  - 2.1.6 Site Analysis Diagram
- 2.2 Client / Users Analysis
  - 2.2.1 Functional Relationship
  - 2.2.2 Activities
  - 2.2.3 Social Pattern
  - 2.2.4 Organizational Hierarchies in Stilt Homes
  - 2.2.5 Schedule of Accommodation
- 2.3 Subject Analysis
  - 2.3.1 Architectural Language
  - 2.3.2 Precedents

### **3. Process**

- 3.1 Organization & Zoning Period
- 3.2 Conceptual Stage
- 3.3 Schematic Design
- 3.4 Design Development
- 3.5 Design Development I
- 3.6 Design Development II

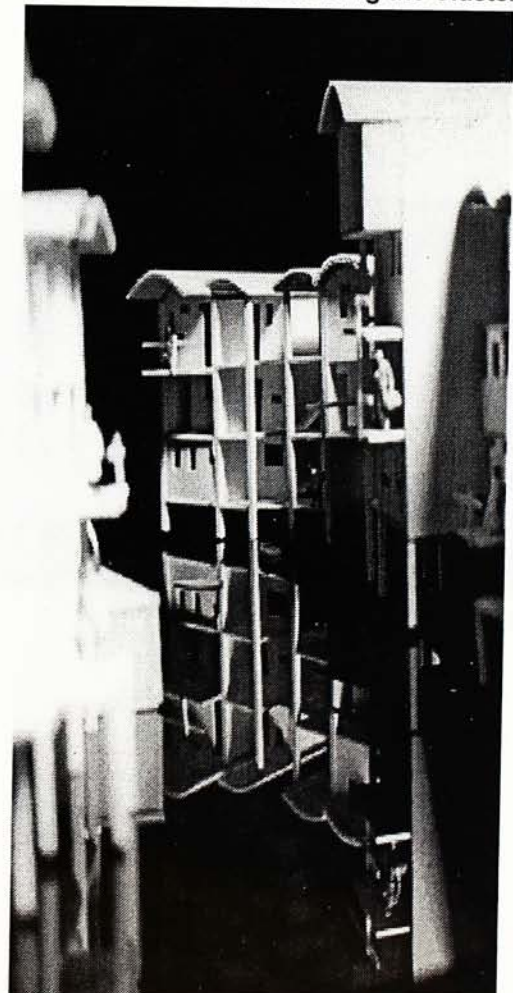
### **4. Final Project**

- 4.1 Settlement Design in 4 Level
- 4.2 Site Planning
- 4.3 Methodology:
  - Diagram of Dwelling Units Formation
- 4.3.1 Resident's Requirement
- 4.3.2 One Man in Tai O
- 4.4 Cluster Level
  - 4.4.1 Cluster
  - 4.4.2 Activities in the Cluster
  - 4.4.3 Cluster Level
- 4.5 Open Space Level
- 4.6 Details & Construction
- 4.7 Special Studies: Material

### **Appendix**

Programming report  
Schedule of Work  
Bibliography

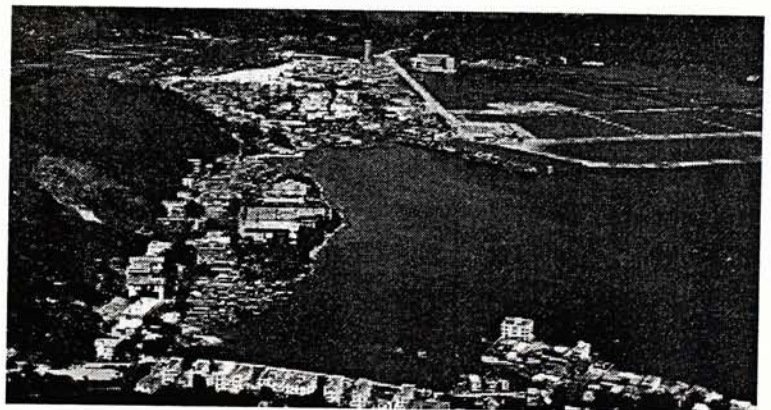
Model showing the Cluster





# 1. Introduction

- 1.1 Design Objectives
  - 1.2 Problem Defined
  - 1.3 Description of Client & Users
  - 1.4 Mission and Goals
- 



Aerial Photo of Tai O

## 1. Introduction

**Tai O** is one of the most famous historic fishing villages in Hong Kong. However, like other temporary structures, Tai O stilt homes face health and fire hazard problems. The purpose of this project is to resettle the residents of the temporary stilt homes in a way that contributes to the **neighbourhood community and their sense of belonging**. The strategy is to create a unified system as an alternative solution. The residents can build their own homes as an expression of their individuality, and communal space will be provided in the neighbourhood. This scheme is derived from the traditional spatial organization of the stilt homes.

### 1.1 Design Objectives





## 1.2 Problem Defined

How are we going to organize such a vast building volume into a well-balanced pattern of interrelated community units, better fitted for the democratic way of life than our present chaotic cities are?

How are you going to balance the basic human needs above economical and industrial requirements with the relationship of neighbourhood?

In this resettlement project, several problems should be considered from the past experience of Public Housing Scheme...

### **Basic needs are established but cultural background is not considered...**

The traditional social and communal relationship of Tai O is well developed. However, quite often, in resettlement project, a standard dwelling is used to house all sizes of families with different cultural backgrounds. These dwellings do not take into account the socio-economic and communal characteristics of the occupants.

### **Lack of informal character...**

Some planned developments are very rigid in terms of spatial organization. The informality and flexibility which has permitted changes and growth within the traditional settlement fabric are no longer seen in new housing developments which is lack of individuality and the sense of belonging.

### **Disregard of climate factors...**

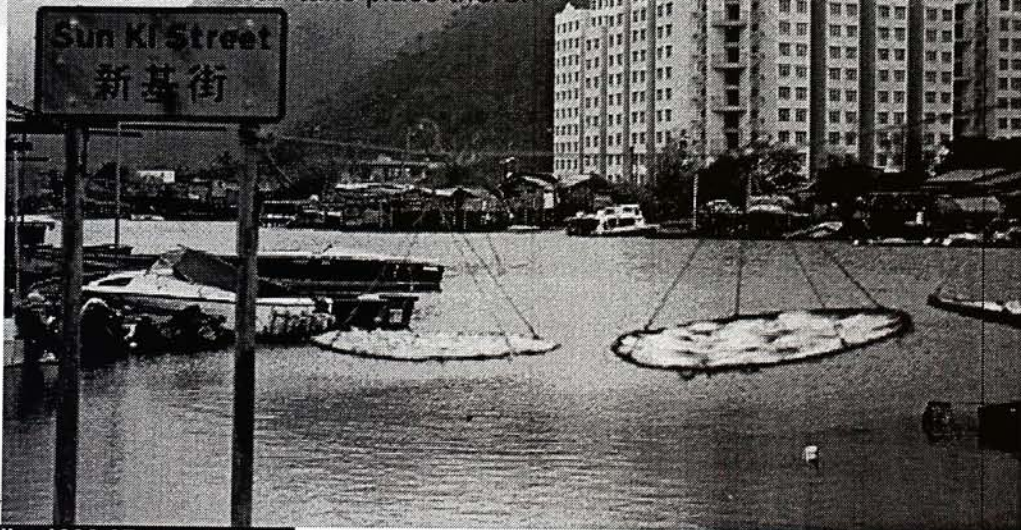
Climate is an important factor affecting site layout and building design. The built form of new developments generally ignore these factors when considering the orientation and the nature of the built form.

### **Inappropriate open spaces...**

In the existing development of Tai O, whenever open spaces are provided, they are not appropriately designed to suit the needs of the people. This lack (or at times over-provision) of open spaces discourages the social, cultural and economic activities which can take place there.

The Asian Wall Street Journal:  
Hong Kong Week, South China  
Morning Post, Sept. 23, 1996

Lung Tin Estate vs  
traditional lifestyles

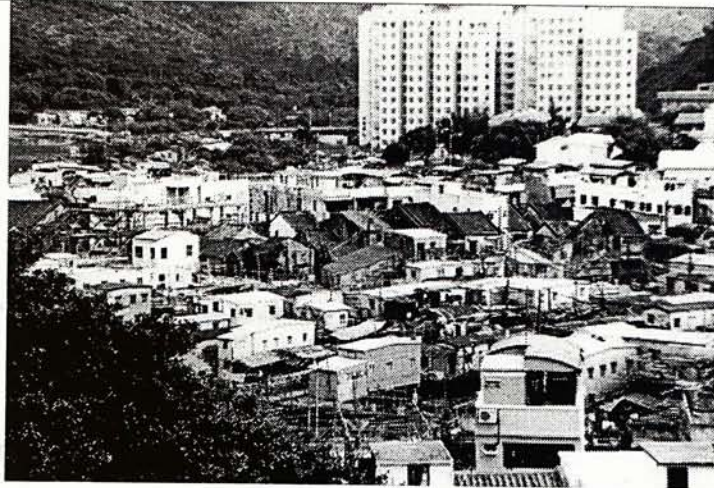




### 1.3 Description of Client & Users

#### **Clients:**

The Community Development Committee of the Hong Kong Housing Society is established for the resettlement and the development of traditional historic village or existing community in Hong Kong by the government. The nature is **to co-operate the residents to rebuild their community by the application of several innovative planning system.**



Public Housing with Tai O old village

#### **Users:**

There are 1358 residents for resettlement from about 370 families with **well-developed community relationship.** The main users for the resettlement is the elderly as the young generation moved out in the past 10 years. However, the young generation and nuclear family are also potential to come back as the resettlement project improves the living quality in Tai O, and also the chance of career is improved.



Tai O Stilt Home

### 1.4 Mission and Goals

#### **Mission:**

To resettle the residents of the illegal structure (Stilt Home) in Tai O due to the improvement of health and safety; to keep the **spirit of community, neighbourhood and the sense of the belonging** in higher living standard.

#### **Goals:**

##### **1. Vitality**

To create a communal form which at various levels supports its vital functions for the life, the biological requirements and capabilities of residents in Tai O in improvement of living standard and communality.

##### **2. Imageability**

To follow the Tai O traditional spatial character to encourage the social, cultural and economic activities.

##### **3. Flexibility**

To evolve a framework within which progressive development can occur with ease and efficiency.



## 2. Project Analysis

### 2.1 Site / Context Analysis

#### 2.1.1 Location

#### 2.1.2 Climate

#### 2.1.3 Special Studies: Natural Ventilation

#### 2.1.4 History -- Sequence of the Settlement

#### 2.1.5 Development of Tai O

#### 2.1.6 Site Analysis Diagram

---



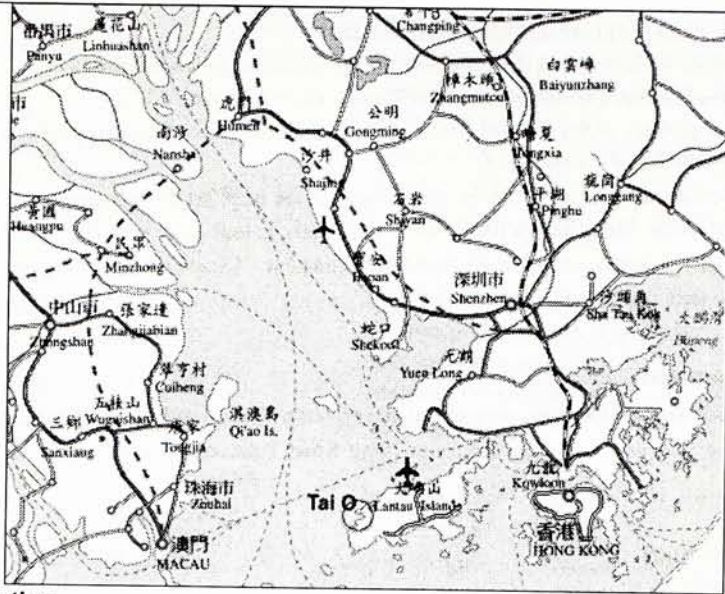
Temporary Market at the Pier



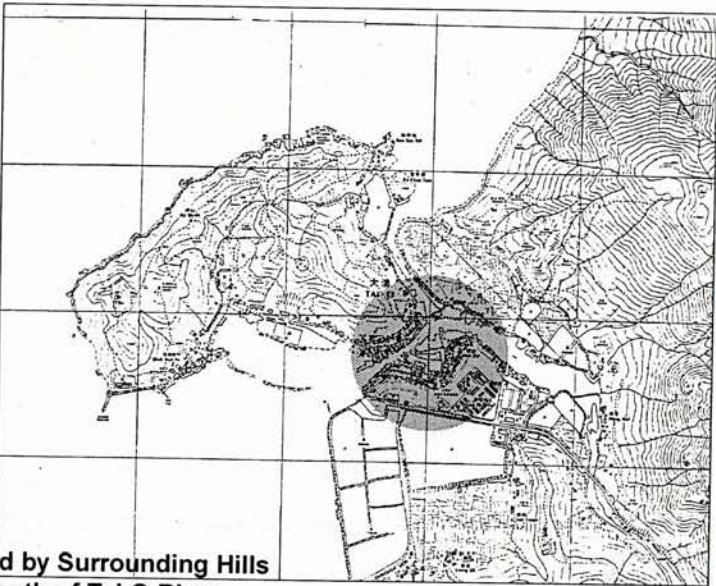
## 2.1 Site / Context analysis

### 2.1.1 Location

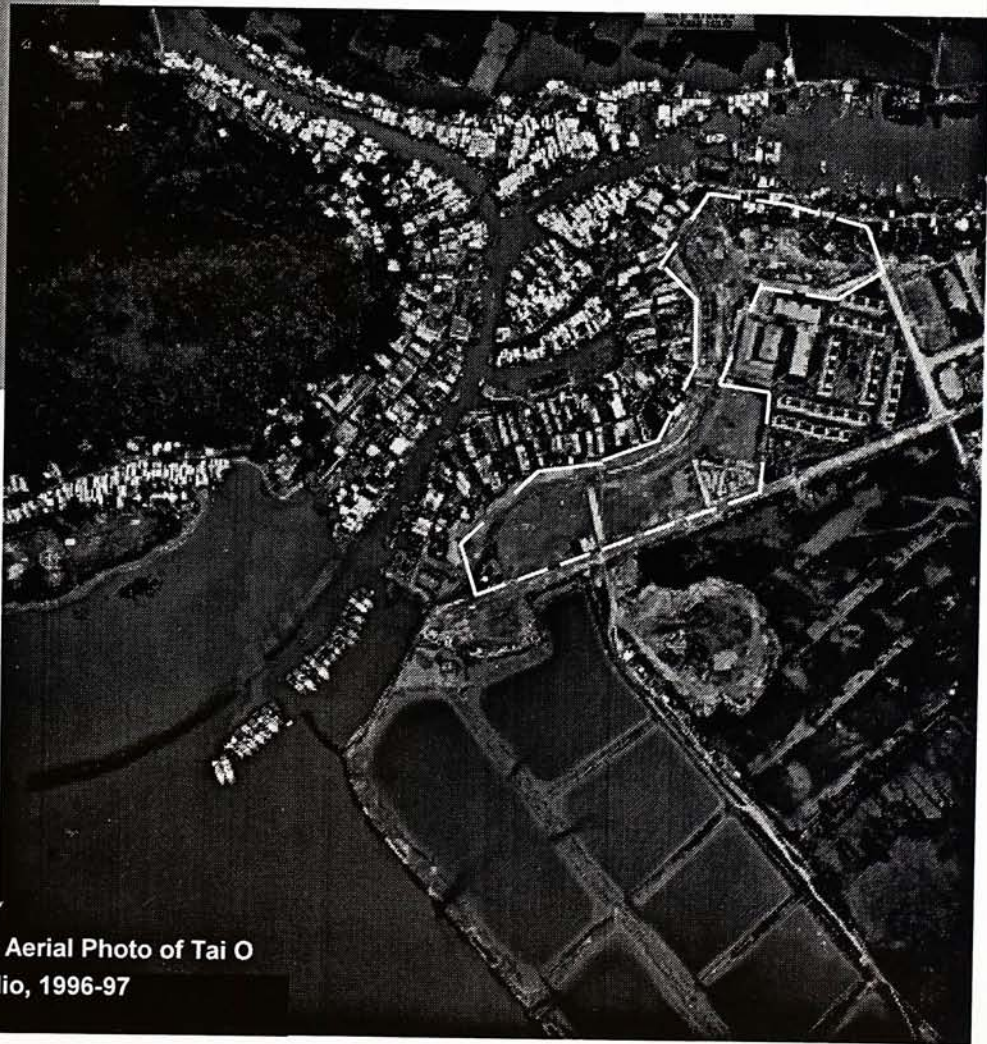
Tai O is sited on the southern Lantau Island. It faces the mouth of Pearl River and near the new airport. It has potentially developed a point for tourism in Hong Kong and also the government planned to build a typhoon shelter for the Chinese fishing boats for the services supporting. At the past hundreds years, it is the important source of salt producing and fishing market. One of the oldest fishing villages is located there. It has its own unique community and the relationship of neighbourhood.



Site Location



Protected by Surrounding Hills  
at the Mouth of Tai O River



Aerial Photo of Tai O

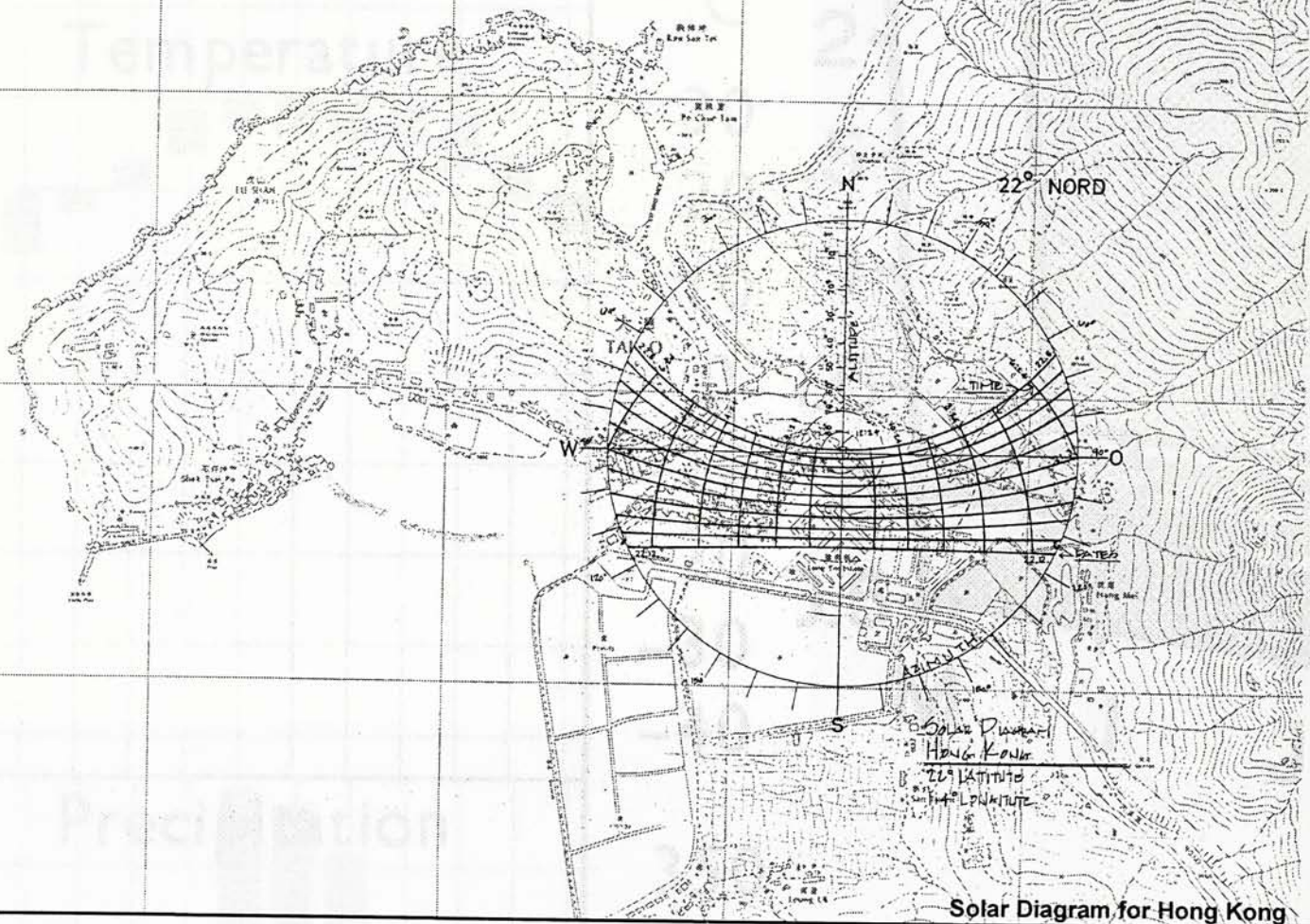


### Concern

## 1. Solar Diagram

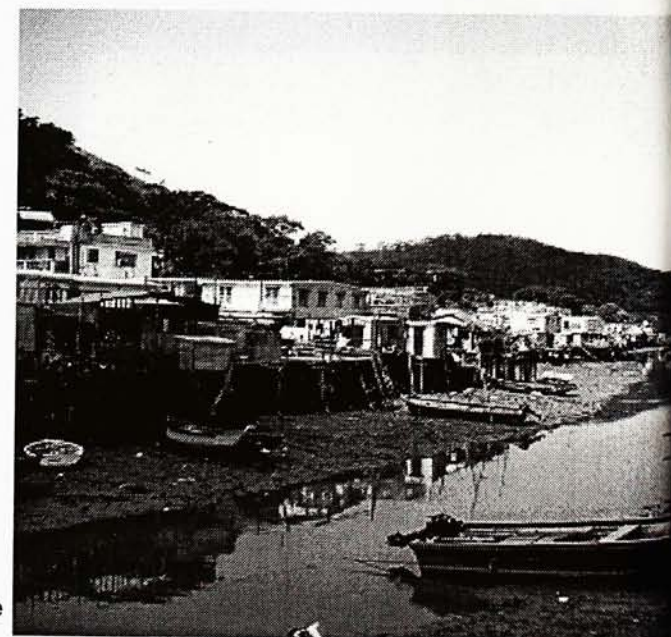
Tai O (22°15' N, 113°51'E)

In Hong kong, facing south is much appropriate for the openings as diffused sunlight come from South in Winter and shading from North in Summer. Indeed, in Tai O, direction is not the most important factor as the devices can be added in change of direction.



## 2. Max. & Min. Height of High & Low Waters in Tai O

The largest difference between high & low water level is about average 2.7m for extreme case. For the design of ground level setting should be considered much more.



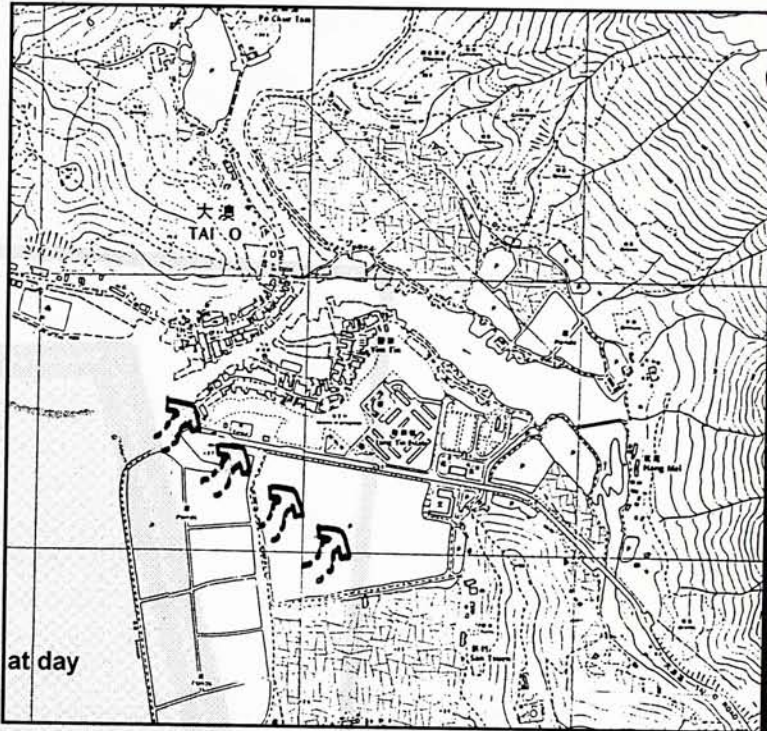
### Low Tide & High Tide



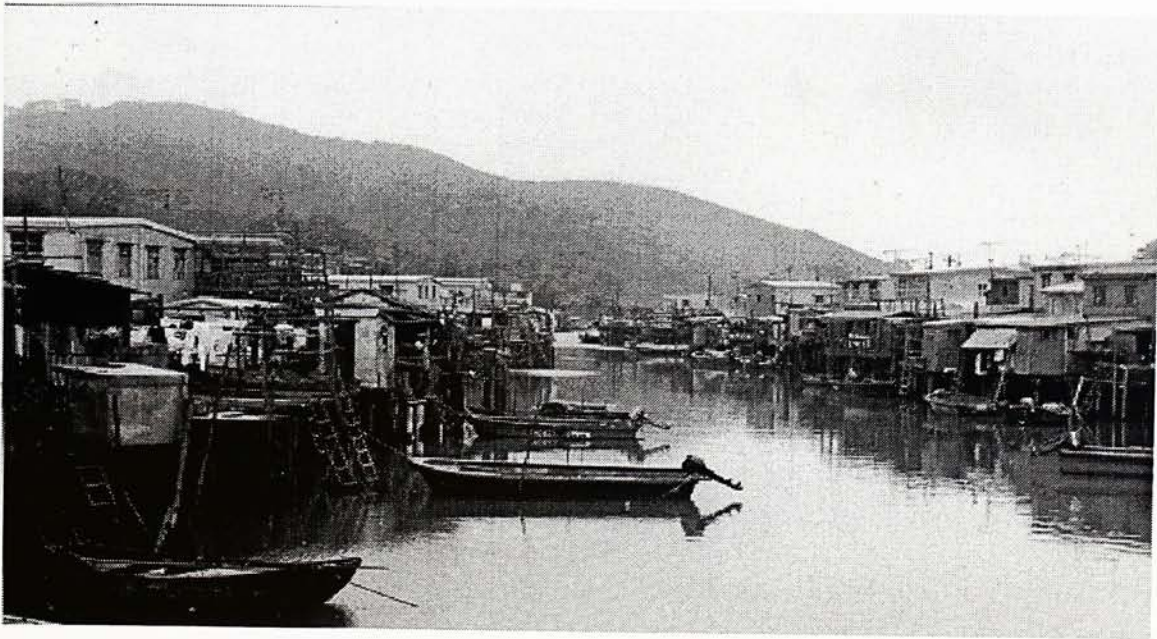
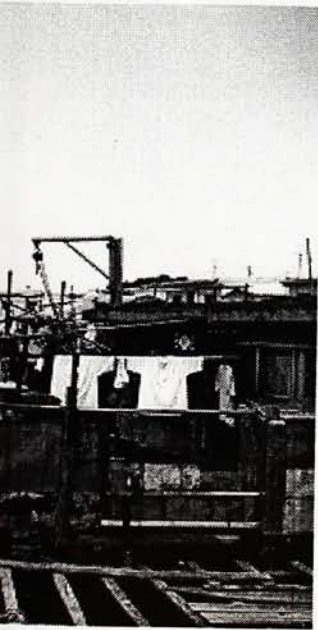
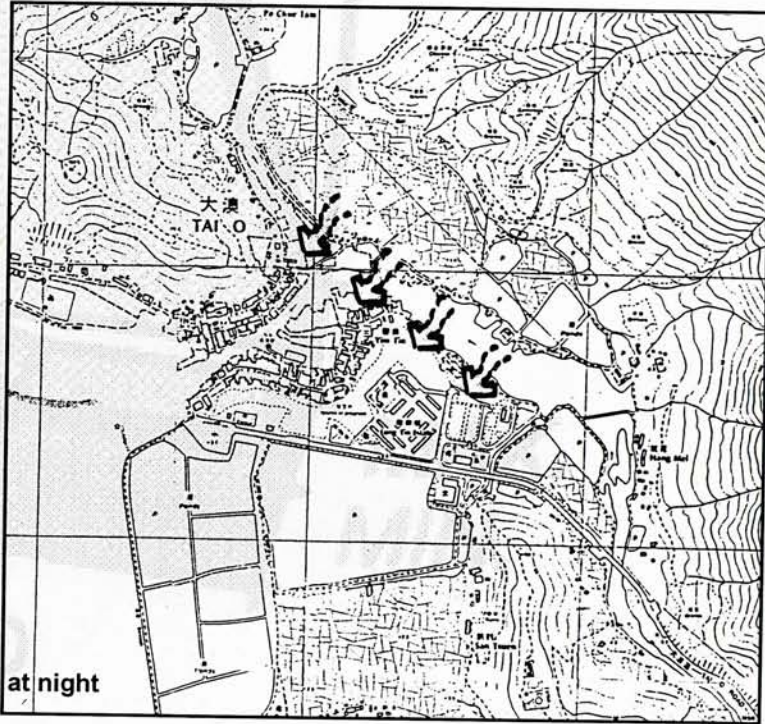
## 3. Wind Direction

In Hong Kong, the wind direction is mainly in East. However, due to the protection of surrounding hills for the lower level of Tai O River, micro-climate should be more important. The direction of the onshore wind at day and offshore wind at night should be considered much more.

Onshore Wind at day

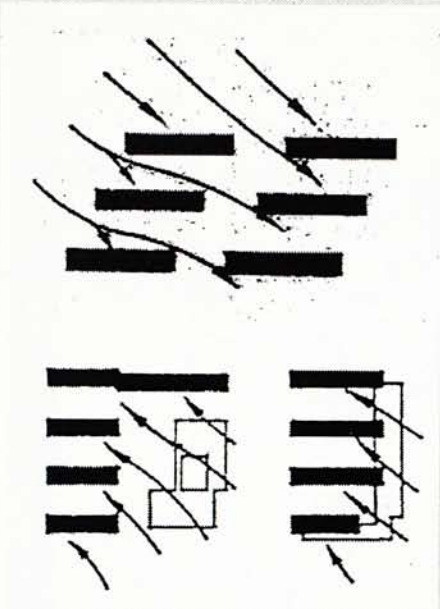


Offshore Wind at night





2.1.3 Special Studies: Natural Ventilation



Arrange building staggered to allow more air flows in

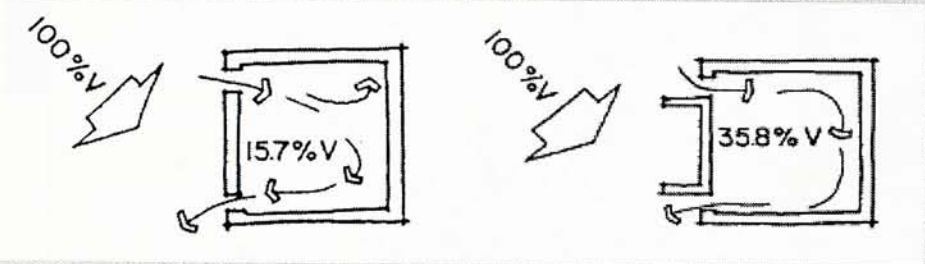
Wind Concept on the Experimental Housing in Tai O

In the design process, the project is considered to use the natural ventilation due to the **energy efficiency, running cost and the traditional requirements** by the users.

For the settlement organization, the modern settlement mainly followed the rigid grid and fixed pattern. However, by consideration, the random organization is arranged for the building *staggered to allow more air flow in*. Also, low and taller buildings arranged alternatively to improve the natural ventilation. It borrows the idea from the traditional vernacular stilt home's organization.

Furthermore, low-rise building is set in upwind position (southern side) to increase the ground level wind speed. Generally, higher buildings is located at the northern side as a *barrier for the dry and cool wind in Winter*.

Finally, for the dwelling unit, the external fins, which are studied by computational fluid dynamic, are added on the openings to increase the wind speed for the natural ventilation of the interior.



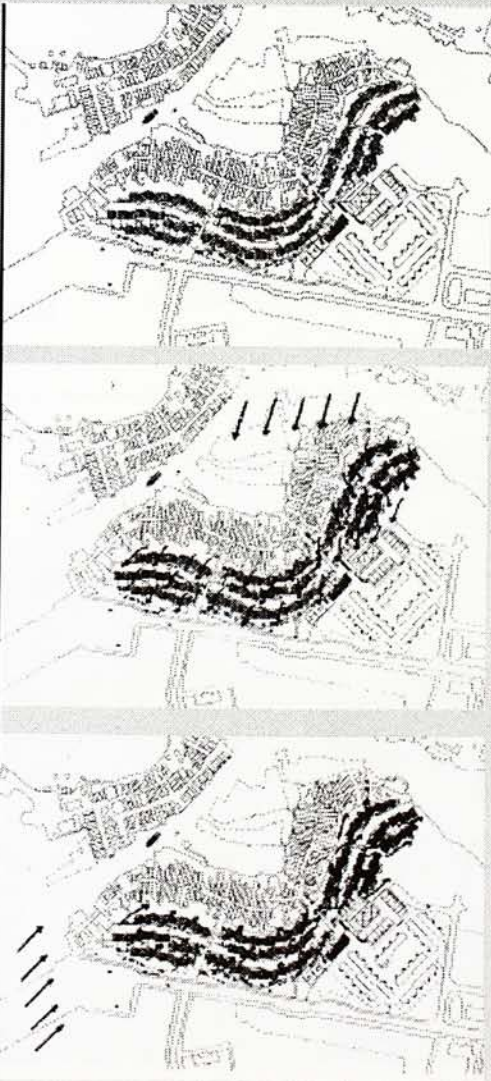
Add the external fins to increase the wind speed for the natural ventilation of the interior

Wind Pattern for the building arranged in rigid grid and layout  
All the building is arranged in certain height

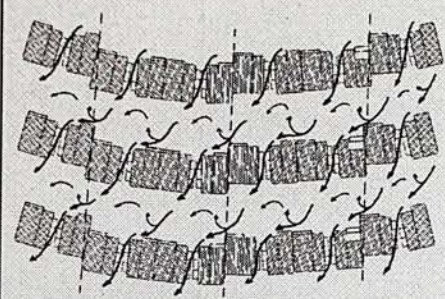
**Improvement:**  
Wind Pattern for the buildings arranged **at random and staggered**

The buildings are arranged in varied height. The average height of the northern row is 13.5m. The average height of the middle row is 12m. The average height of the southern row is 10.5m.

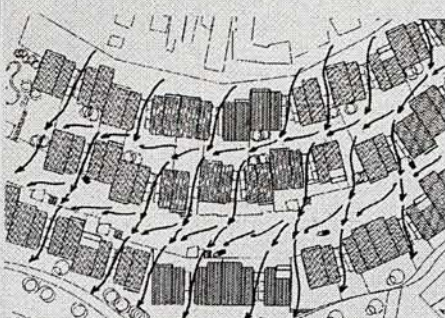
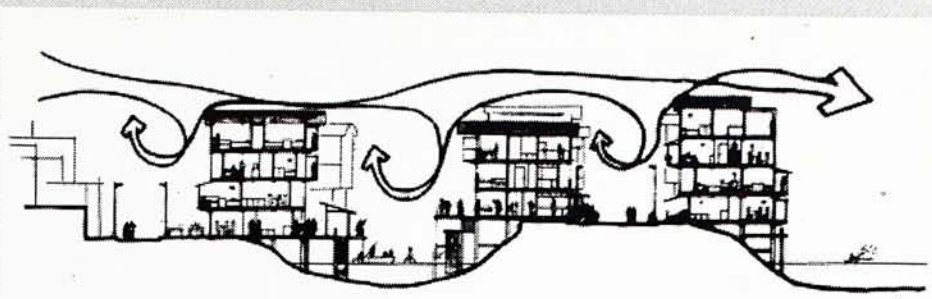
**It allows more air flow in and increases the ground-level wind speed.**



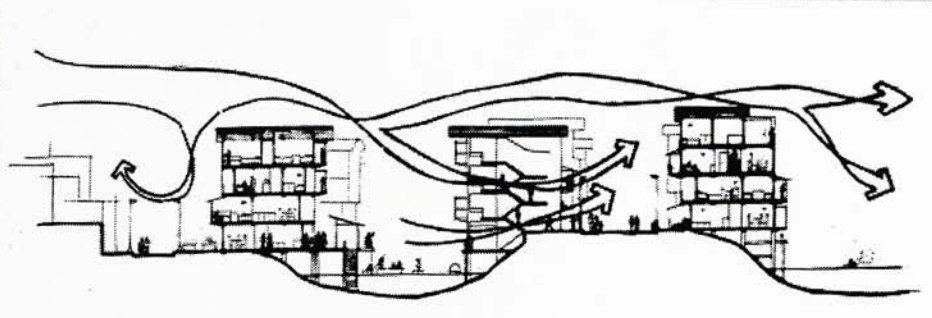




The buildings are arranged at rigid & regular organization to block the wind flow.

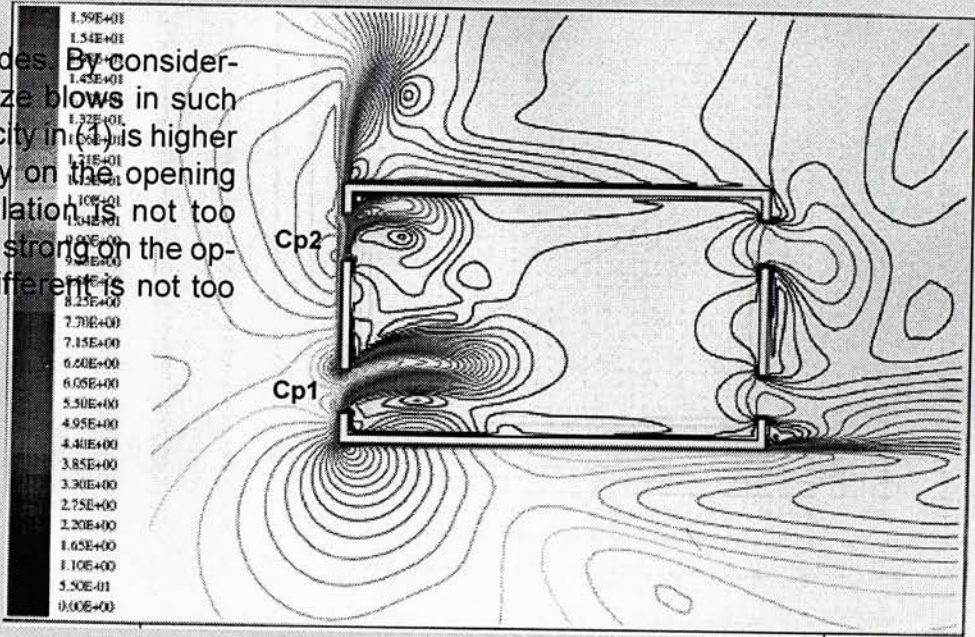


The buildings are arranged at random and staggered to allow more air flow in and make the wind flow smoothly.



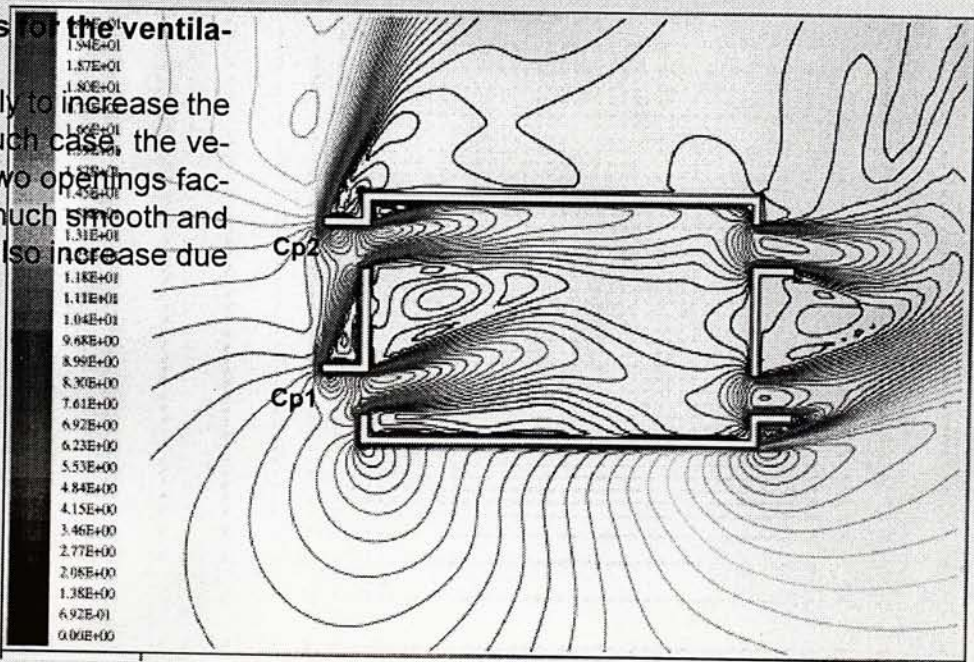
Without any Wind Devices

Openings are located in both sides. By considering the onshore wind, the breeze blows in such corner and  $Cp1 > Cp2$ , the velocity in (1) is higher and the air movement is mainly on the opening (1). However, the cross ventilation is not too smooth as the suction is not too strong on the opposite side and the pressure difference is not too large on the two sides.



Adding External Fins (Devices for the ventilation)

External Fins are added vertically to increase the pressure on the openings. In such case, the velocity increases largely on the two openings facing the wind. The ventilation is much smooth and the velocity of outgoing wind also increase due to the external fins.





## 2.1.4 History -- Sequence of the settlement

**North Sung-era (960-1127):** Salt pans in Tai O is first found for the salt producing.

**1650:** Kat Hing Back Street first appeared. Tai O become a trade & supply point for fishingboats and trading ships besides the salt producing.

**1750:** Wing On Street & Tai Ping Street appeared as the population increased and settle together.



**1750**

**1850:** 3 rows of Stilt Homes appeared.



**1850**

**1930:** Kat Hing Street, Market Street and more Stilt Homes appeared.



**1930**

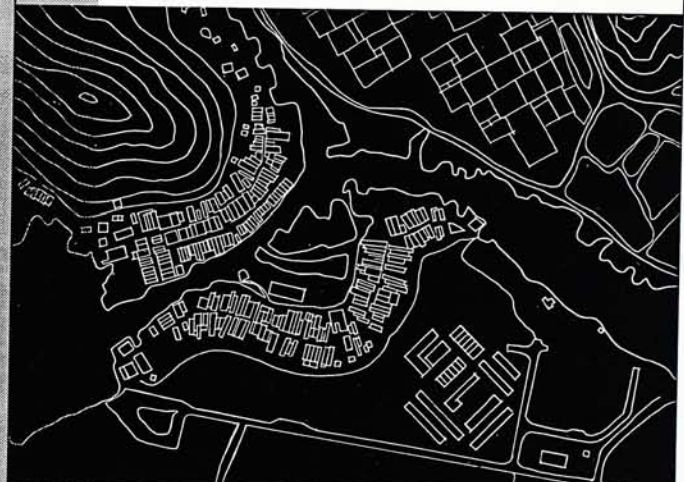


**1940:** During the World War II, salt producing and fishing became inter-dependent. Salt producing was necessary as salt was one of the major military needs. Also, fishes caught were more than enough, the fishermen would salt the fishes for future use.

**1965:** Tai O declined in its importance as urban development. Fishing and salt producing disappeared gradually. The fishermen had to go farther away for several days and settled their family members along the shore. The typhoon shelter off Shek Tsai Po & Tai Chung were

Residents tend to gather along the stream and Stilt Homes in Tai O Chung. The site is selected inbetween the old village in Tai O and the Lung Tin Estate Phase I. There will be a new layer for the settlement of Tai O existing residents along the historic settlement pattern. There is a sewage duct located along the edge of the old village. It have potentially been developed as a stream for the existing residents from the Stilt Homes. It creates the closed relationship again between the life of the residents in Tai O and the waterfront...

**1980:** Lung Tin Estate Phase I is built to resettle the Stilt Homes residents in Yau Chung and Yim Tin Creek.



1990

**1990s:** Lung Tin Estate Phase II is built to resettle the remained Stilt Homes residents. However, the public housing stands empty till now. The Housing Authority plans to change them as HOS.



1997

**1997:** SAR builds up. Experimental Housing Project in Tai O have been carried out by the CDC of Housing Society. Tung Chung New Town forms in 1998 for supporting the new airport. The shelter is built in 2001 to support the fishing career in Tai O.

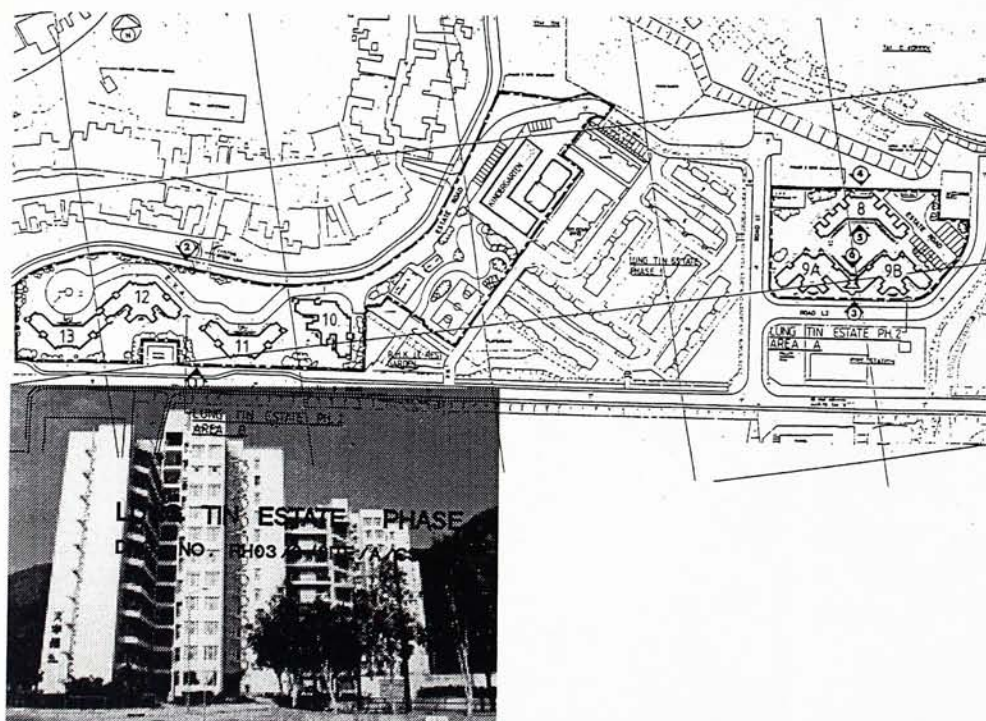
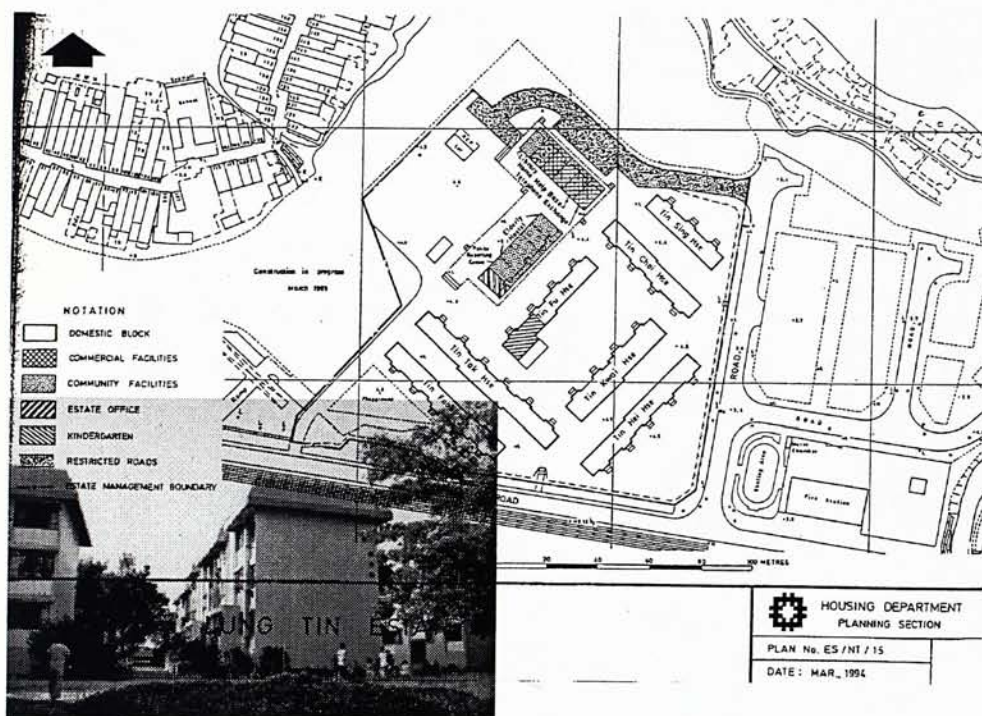


## 2.1.5 Development of Tai O

### Zoning Condition & Future Development

For the development of Tai O, it has no statutory Outline Zoning Plan. Under the last Outline Development Plan in 1988, Tai O is divided into 6 major land-use zones including **sewage treatment, the industry zone and the development of typhoon shelter.**

For the existing condition, Housing Authority built Lung Tin Estate Phase I and Phase II to resettle the residents in the Tai O Stilt Homes. In this project, the site is located at the Lung Tin Estate Phase II partially and the industry zone partially. Due to the whole planning and the appropriate height restriction, the Lung Tin Estate Phase II is skipped from the site.



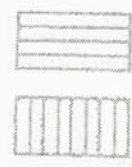
Advanced Architectural Design Studio, 1996-97  
Design Report

### Lung Tin Estate Phase I

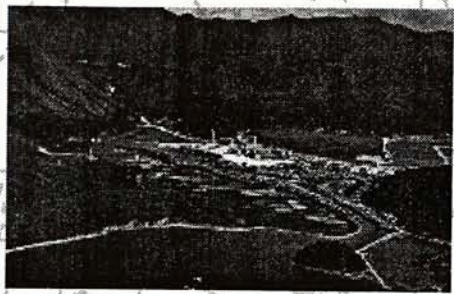
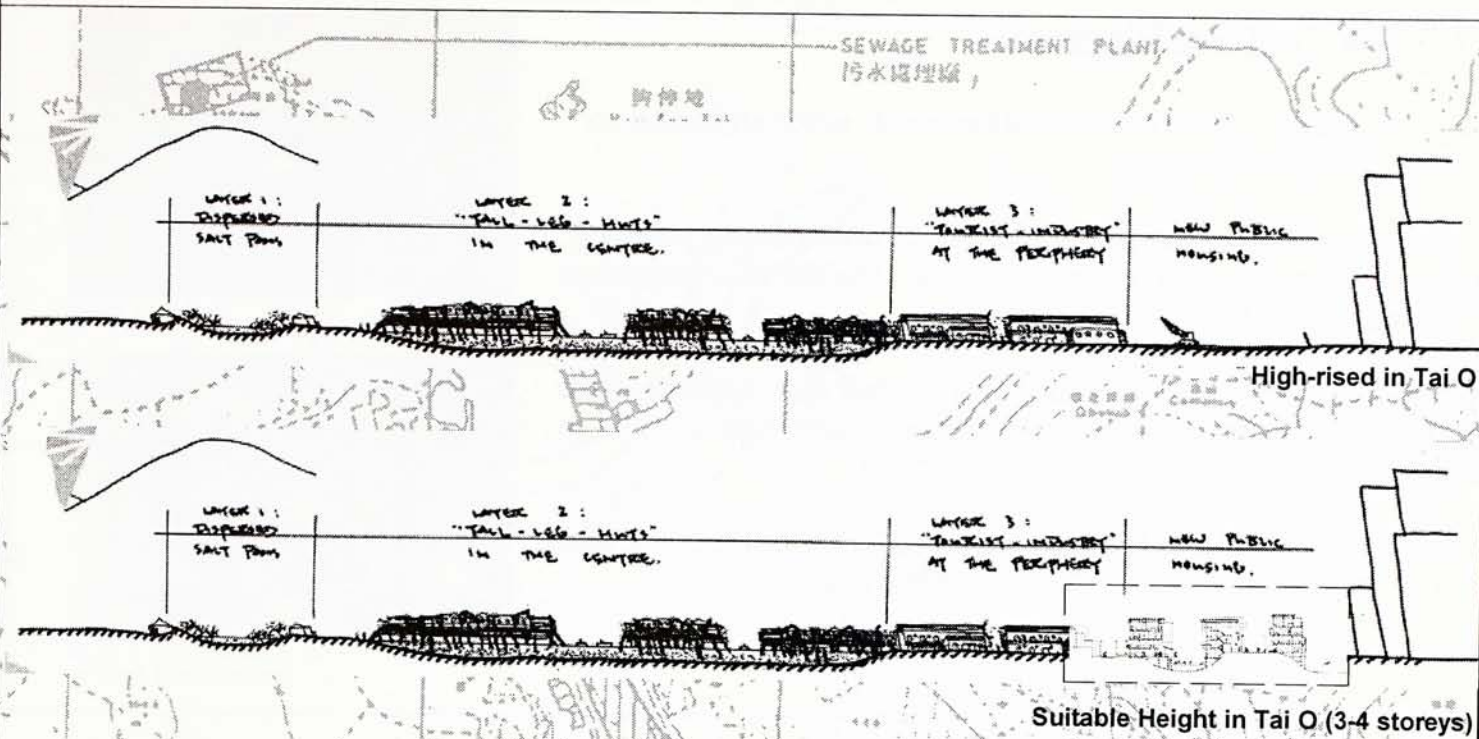
Lung Tin Estate was the first Rural Housing project (RPH) introduced in 1973 undertaken by the Housing Authority. It provides 184 flats (for 685 residents), comprised a market / shop units and ancillary GIC facilities was completed & occupied in 1980. There are **7 housing blocks**. They are **linear in shape of 3 storeys high**. There are one kindergarten, one home-help service centre.

### Lung Tin Estate Phase II

It is located to the east & west of the existing estate Phase I. It is approximated 2.13ha. gross. It is composed of 6 blocks of varying heights, **ranging from 6 to 12 storeys**. There are altogether 550 flats for 2,000 people. However, in reality, there are many vacancy flats which the residents don't move in.







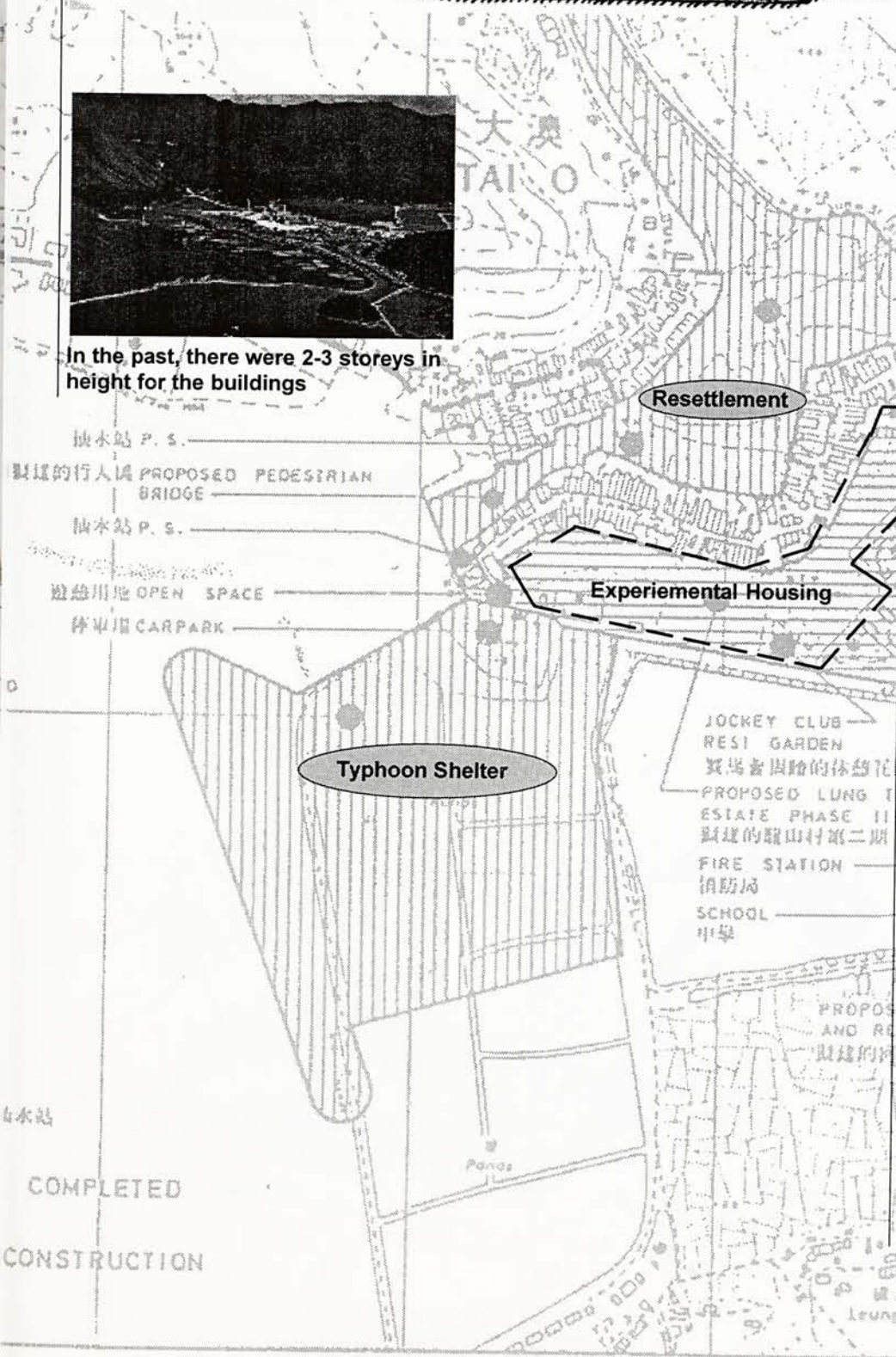
In the past, there were 2-3 storeys in height for the buildings

### Height Restriction & Density Control

The lease conditions of village houses are similar to that of the New Territories. The structure is limited to 3 storeys, not higher than 8.23m on lots of maximum 65.03 sqm each.

For the reality, there are several high-rised buildings (6-9 storeys) for the public housing. Indeed, It totally discourage the existing life and activities of the residents in this vertical development.

For the existing Stilt Home, the density is about **1000 persons per hec**. For the experiment housing, the height limit is in **max. 4 storeys** and the density will be **750 persons per hec**. as the open spaces are provided.



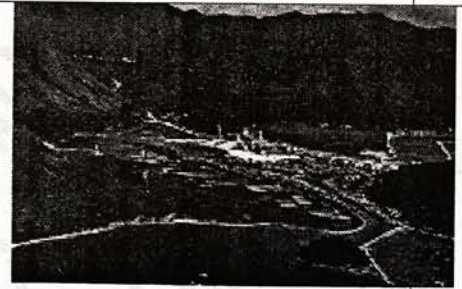
Future Development & Zoning in Tai O



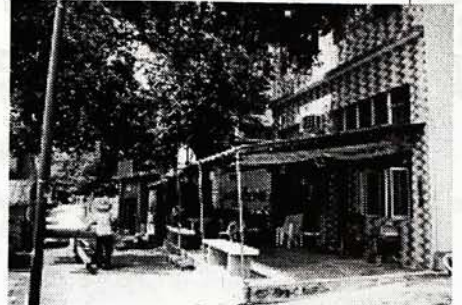
### 2.1.6 Site Analysis Diagram

From site analysis, there are several key points which should be considered in the design stage:

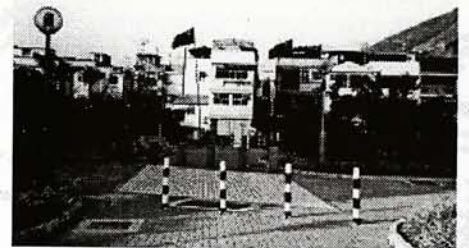
- the site is located **between the old village and the new housing**. The axis and grid setting are the challenge. Traditional organization should be followed.
- the cluster setting in the existing Stilt Homes is in **organic form** which created the transitional space or semi-private space to permit social interaction.
- there are several **critical paths and the open spaces** to be considered as the communal space for the existing users.



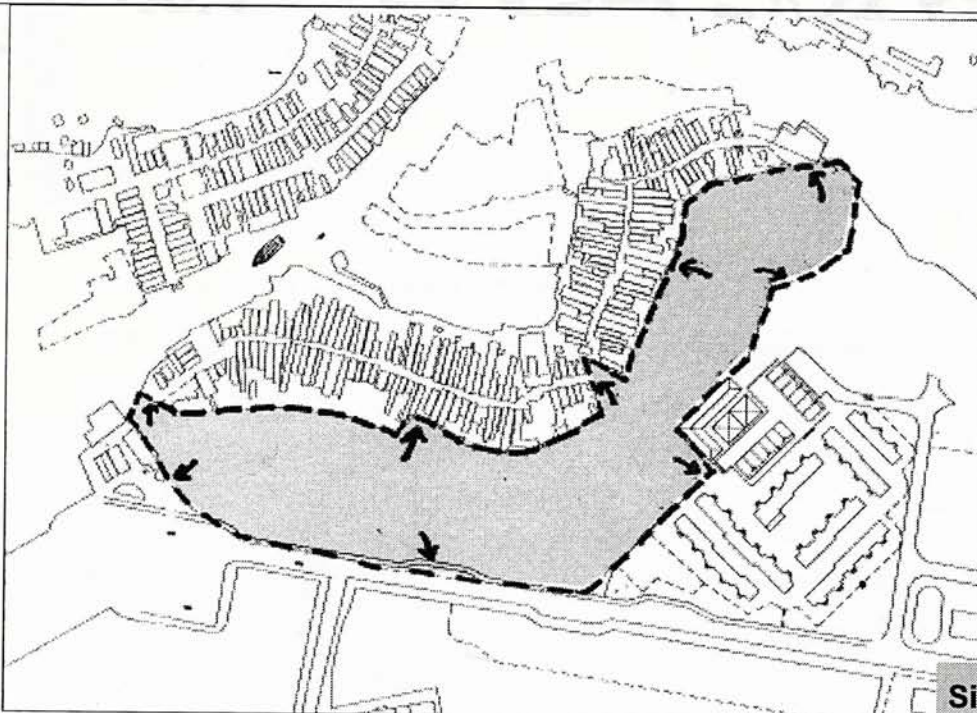
Variated Axis



Transitional Space



Communal Space

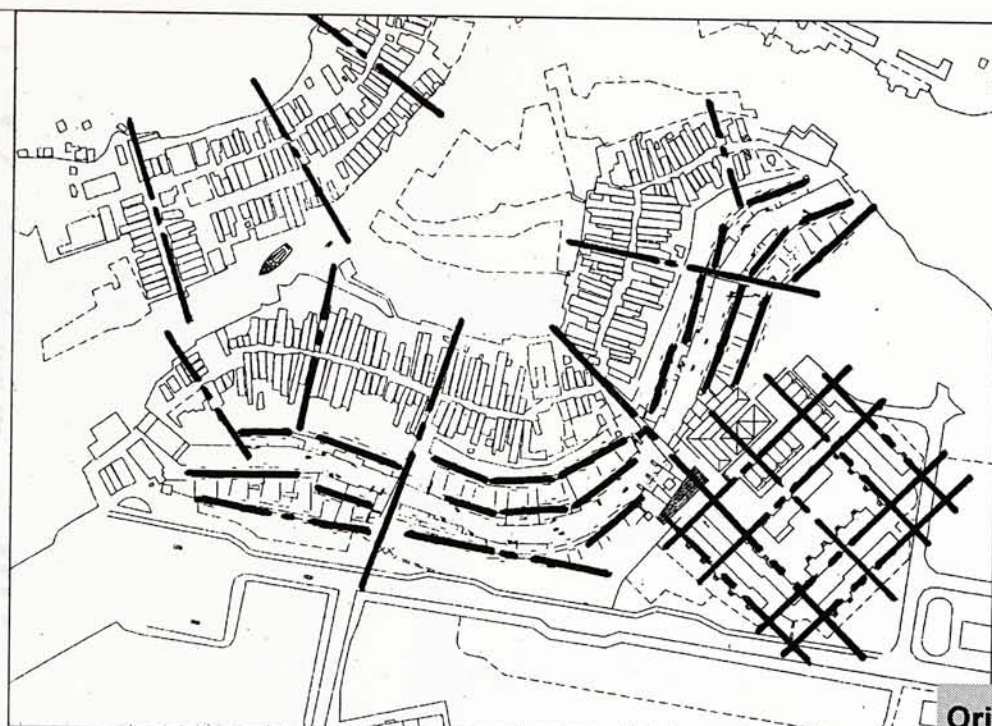


Site Boundary

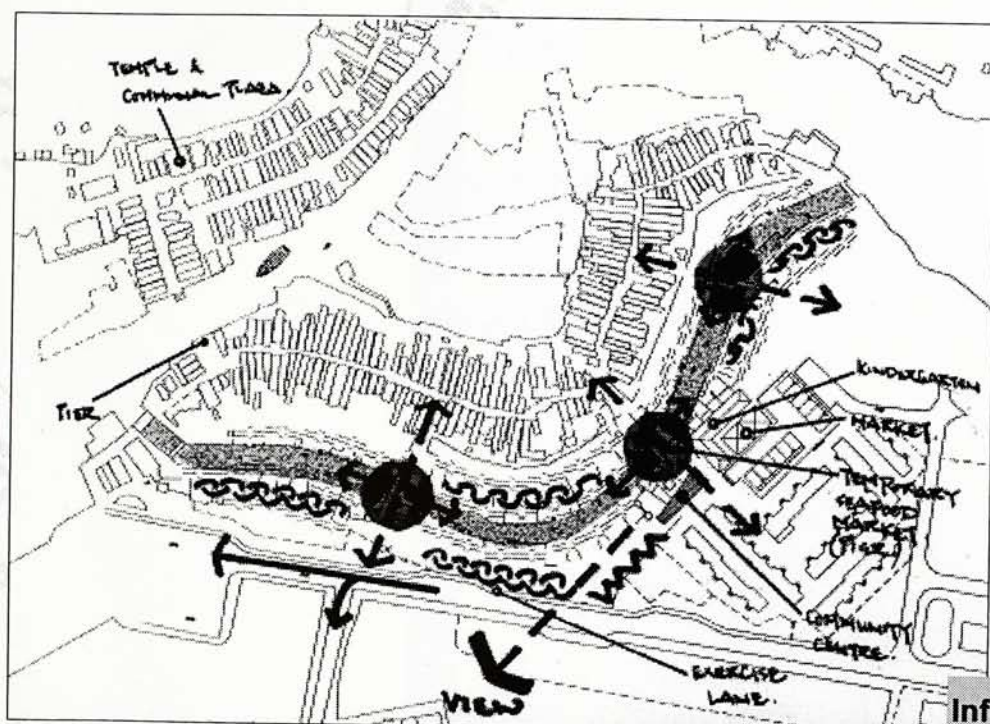


Figure & Ground

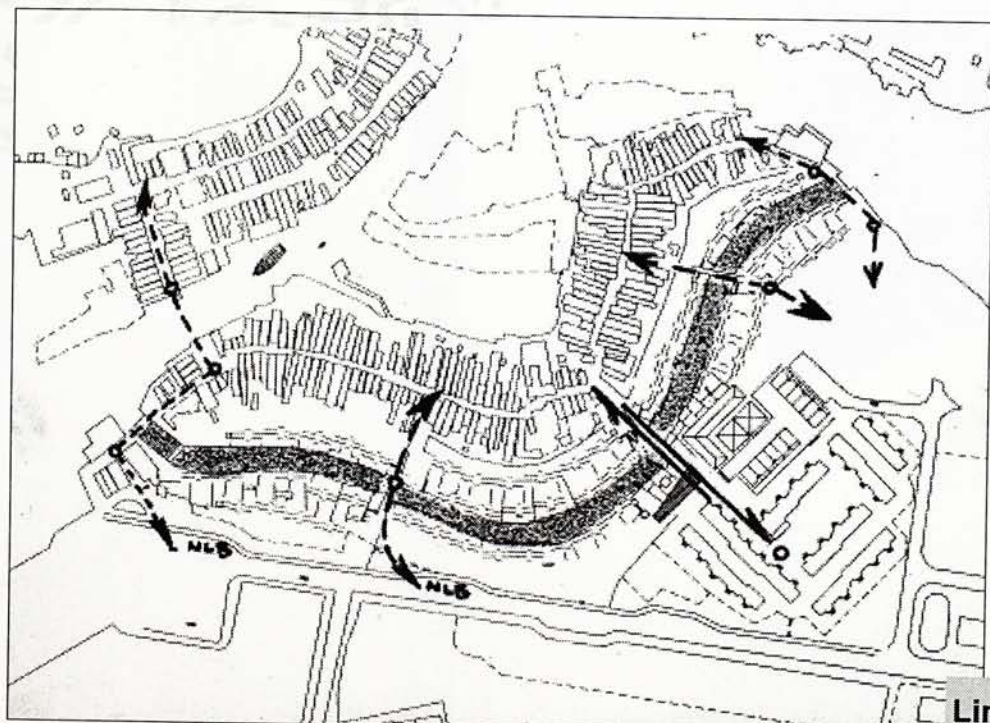




Orientation & Axis



Infrastructure



Linkage and Access



## 2. Project Analysis

### 2.2 Client / Users Analysis

#### 2.2.1 Functional Relationship

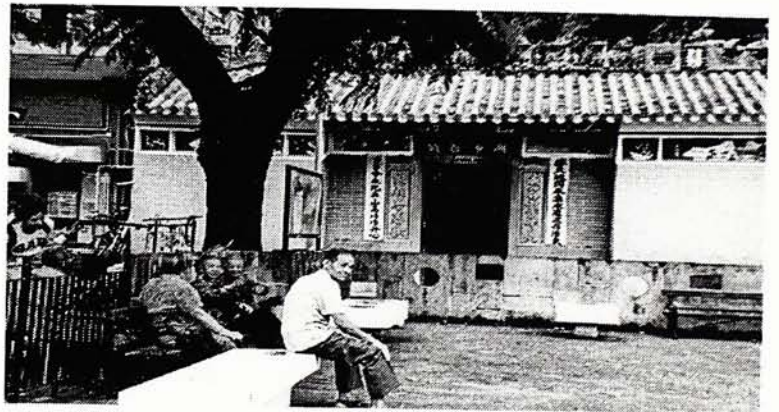
#### 2.2.2 Activities

#### 2.2.3 Social Pattern

#### 2.2.4 Organizational Hierarchies in Stilt Homes

#### 2.2.5 Schedule of Accommodation

---



Chatting in front of the Open Space

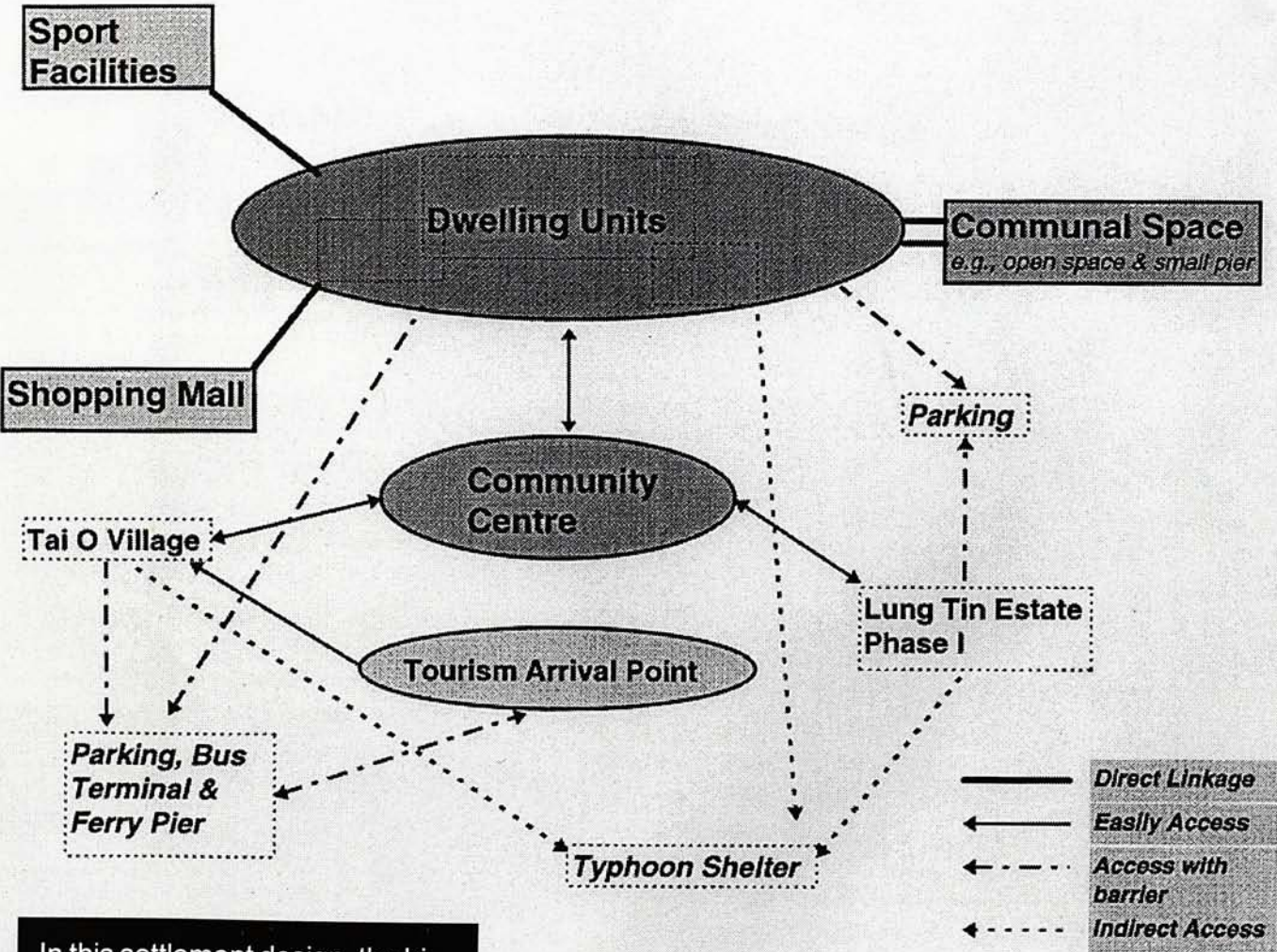


2.2 Client / Users analysis

2.2.1 Functional Relationship

From the CDC. of Housing Society, the needs of the users have been considered and the bubble diagram has been setup.

For experimental project, how to create the flexibility of change and growth is much important. In it, the experience of the traditional Tai O village organization is highly attached.



In this settlement design, the hierarchy and size for certain communities should be considered for 4 level:

- Dwelling Unit Level
- Cluster Level
- Community Level
- Functional Level



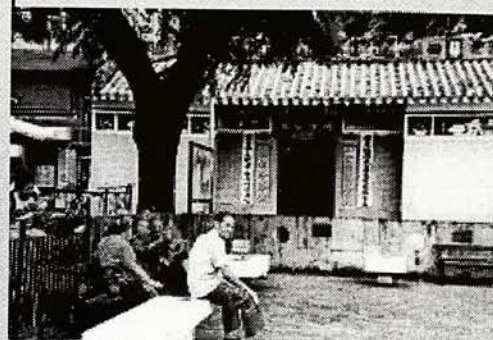
## 2.2.2 Activities



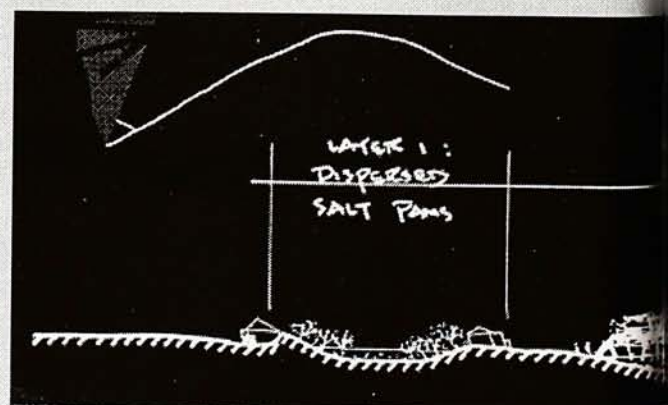
Steyn River



Selling fish at the pier



### Drawings under the tree



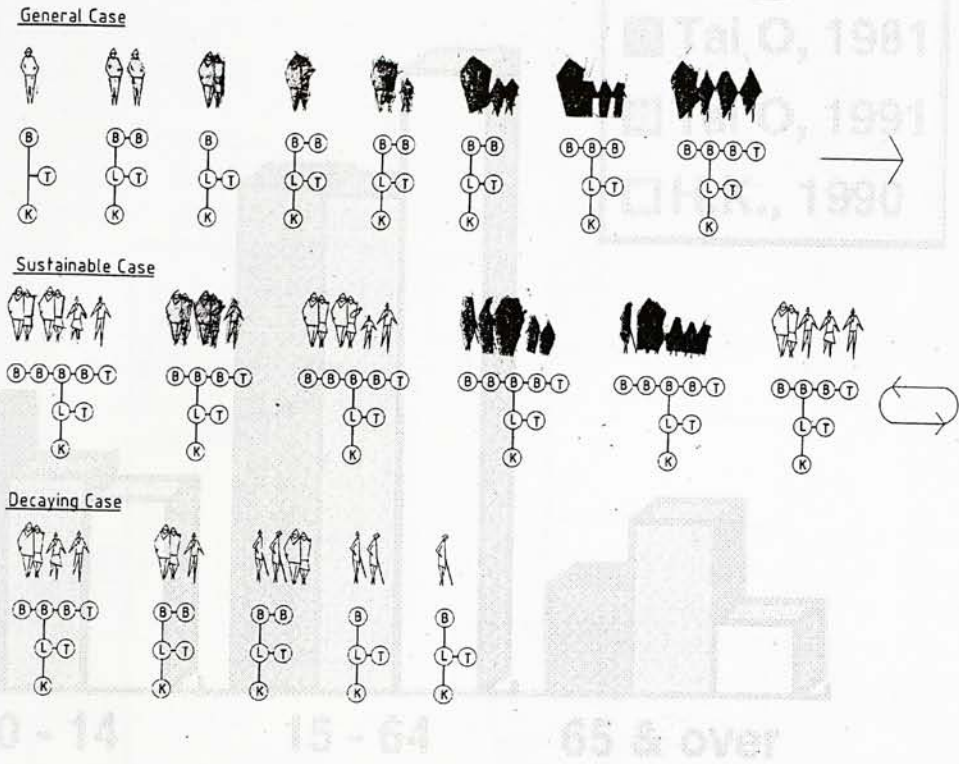


2.2.3 Social Pattern

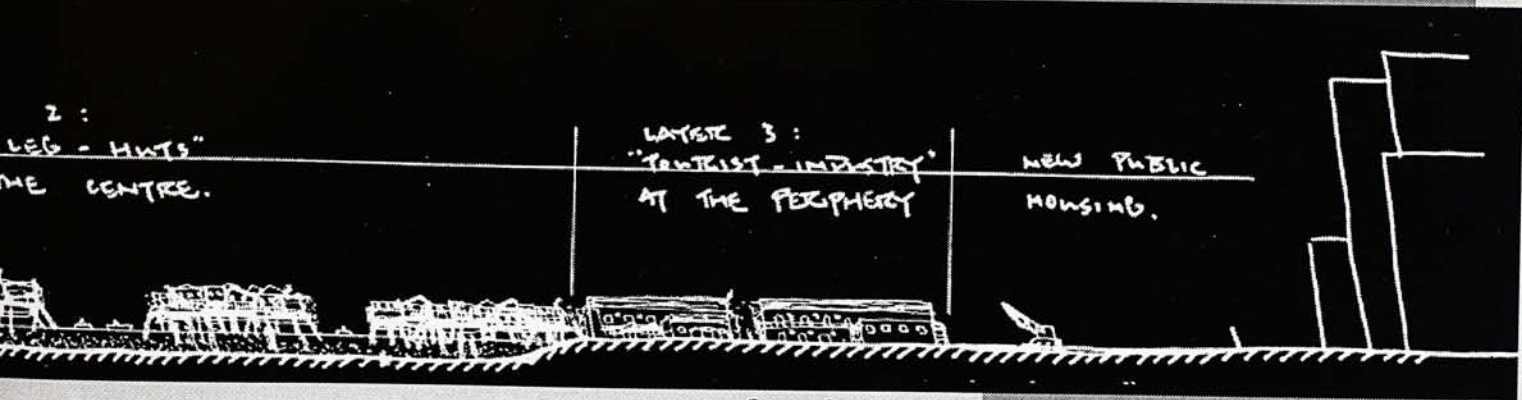
There are 1358 residents for re-settlement from about 370 families with **well-developed community relationship**.

The main users for the re-settlement is the elderly as the young generation moved out in the past 10 years. However, the **young generation and nuclear family** are also potential to come back as the re-settlement project improves the living quality in Tai O, and also the **chance of career is improved**.

Indeed, the social pattern in Tai O is very much influenced by the historical background of the change of career: from salt producing only; to salt producing and fishery; to fishery only; and to fishery and "tourist industry" at present. Most of the residents have **closed relationship or kinship** with each other.



Family Variation in Sustainable & Decaying Case Population in Tai O compared with population in H.K. (1981&1991, Census)



Cross Section through Tai O Showing 3 Layers of Career Pattern



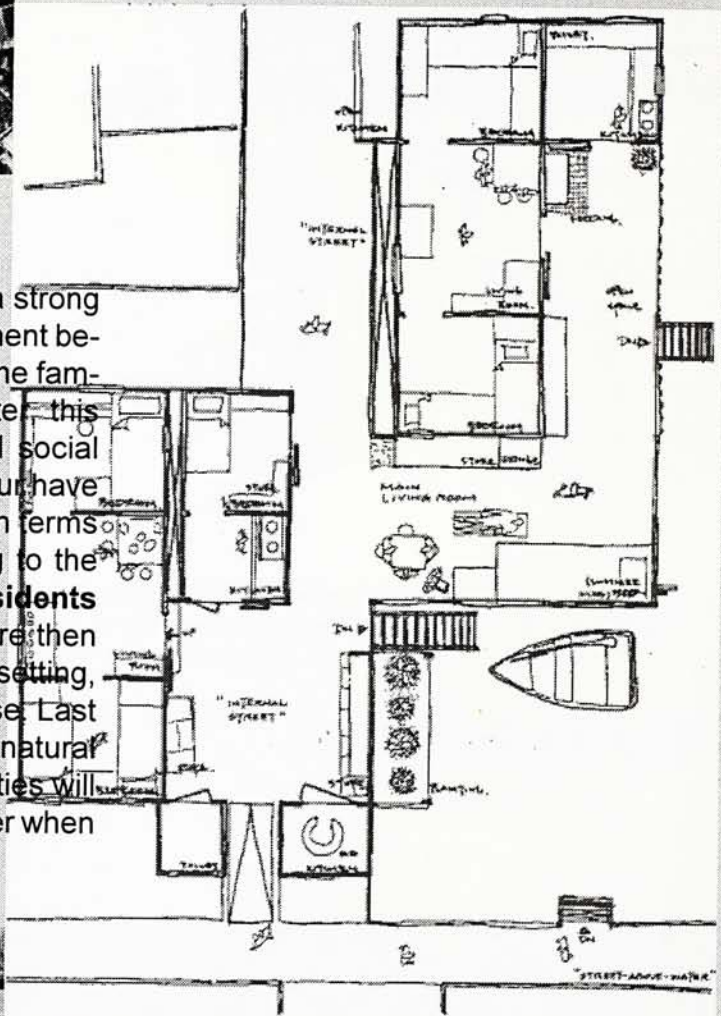
#### 2.2.4 Organizational Hierarchies in Stilt Homes



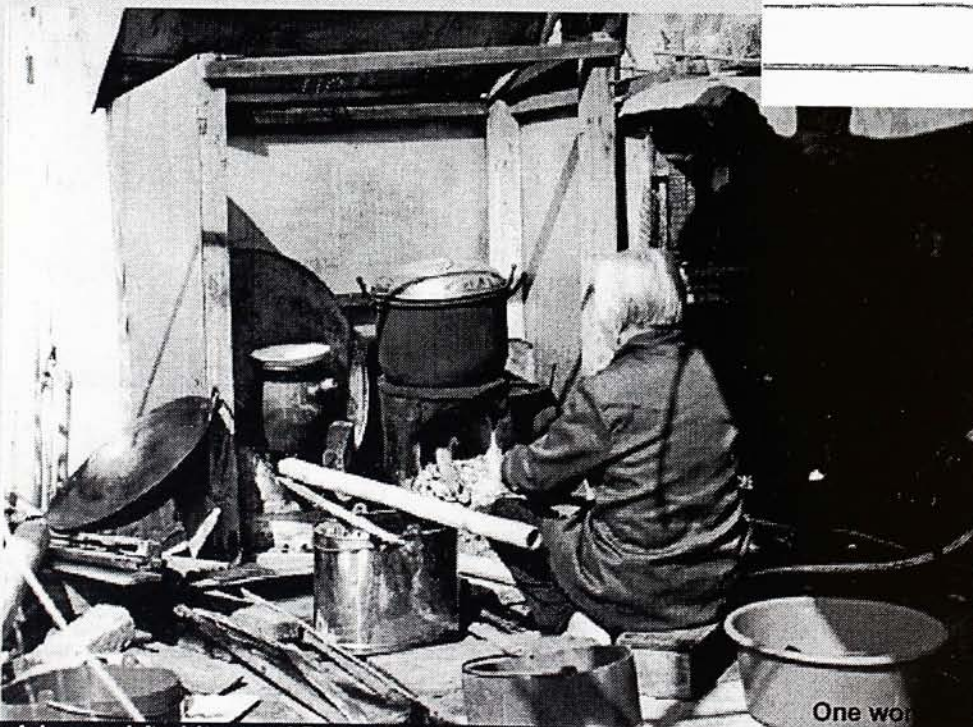
**Stilt Homes which the resettled residents lived as the reference**

## Social Organization

Apart from space for the career, social space is also a strong organizing element for these huts. The organizing element between the **negative space** is the main living room of one family. In most cases, locating at the corner of the cluster, this living room serves both functions as circulation and social space. In terms of circulation, members of the neighbourhood have to by-pass this living room before getting back home. In terms of social space, this room, with big windows opening to the outside, acts as a **semi-public space allowing the residents chatting with each other**. Other functional spaces are then clustering around this social space to form the whole setting, like the concept of a traditional Chinese courtyard house. Last but not least, "internal streets" (semi-public) become a natural extension of the living room where certain social activities will take place such as housewives chatting with one another when making food or brushing clothes there.



### Cluster Plan



**One worker work at the balcony -- Semi-private Space**



### Space for lifestyle

Though the fishermen are then living in huts rather than on fishing-boats after building a hut, they still continue fishery. Instead of sailing the big fishing-boats for fishing, they sail **small sampans** to do so. When they come back after fishing, they will tide their sampans under their huts, usually under the area of the living room (Also, sampans are their traditional transport). A **ladder** is usually located near the edge of the living room so that they can have easy access from the living room to the sampan and vice versa. Tools for fishing are also located there **for fully utilizing the space and for career convenience.**



### 2.2.5 Schedule of Accommodation

Building Type	No. of Flat	User	Area (m <sup>2</sup> )
Housing block	100 Two-person Rm.	1-2	18x100
	120 Five-person Rm.	3-4	33x120
	90 Seven-person Rm.	4-5	40x90
	50 Eight-person Rm.	5-6	48x20
	20 Nine-person Rm.	6-9	56x20
	380 units (total)		
Carpark	360 Cars		3x5x360
Community Centre	1 Hall	100	10x10
	3 Activities Rm.	50	5x5
	1 Meeting Rm.	15	8x4
	1 Office	15	4x5
	1 Library	50	5x8
	Toilet	50	5x8
	Car park	10	3x5x10
Open Space	1 Basketball Field	20	100
	2 Table Tennis Table	4	25
	1 Children's playground	40	100
	1 Jogging Track	50	200m length
Service facilities	Transformer Room	2	12x2
	Refuse Room	8	4x8
	Refuse Chamber	2	10x2
	Switch Room	8	5x8
	Meter Room	8	4x8



## 2. Project Analysis

### 2.3 Subject Analysis

#### 2.3.1 Architectural Language

#### 2.3.2 Precedents

---



Form of Stilt Homes



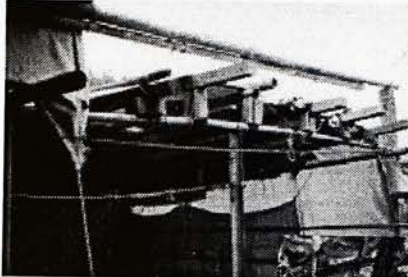
## 2.3 Subject Analysis

### 2.3.1 Architectural Language

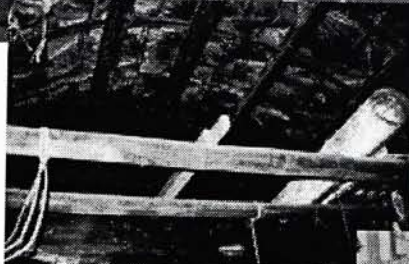
#### Construction of Stilt Homes

The study of a typical Stilt Homes can probably explain the related overall pattern mentioned above. The original appearance of a typical "Peng Houses" is very primitive. It is a single storey of living spaces, with either a vault or a pitch roof, sitting on tall legs. Any other 2-storied-huts (14 ft in height) commonly found today are modified from the former one. Since the huts are standing on water, the living space must be raised. To do so about 4 feet of a stone or wood column is inserted manually into the soil as the foundation, and the exposed rest becomes a supporting leg for the hut. For a stone leg, the top part of which will be carved into a small channel to allow a wood beam to sit on to support the floor. Additional columns, either wood or bamboo, will be used to support the roof. To form the roof, various sizes of wood blocks will be located on top of wood beams sitting on columns in such a way that either a vault roof or a pitch roof results. For the roofing, palm leaf is used as an isolating layer from rain and sun.

Construction of roof



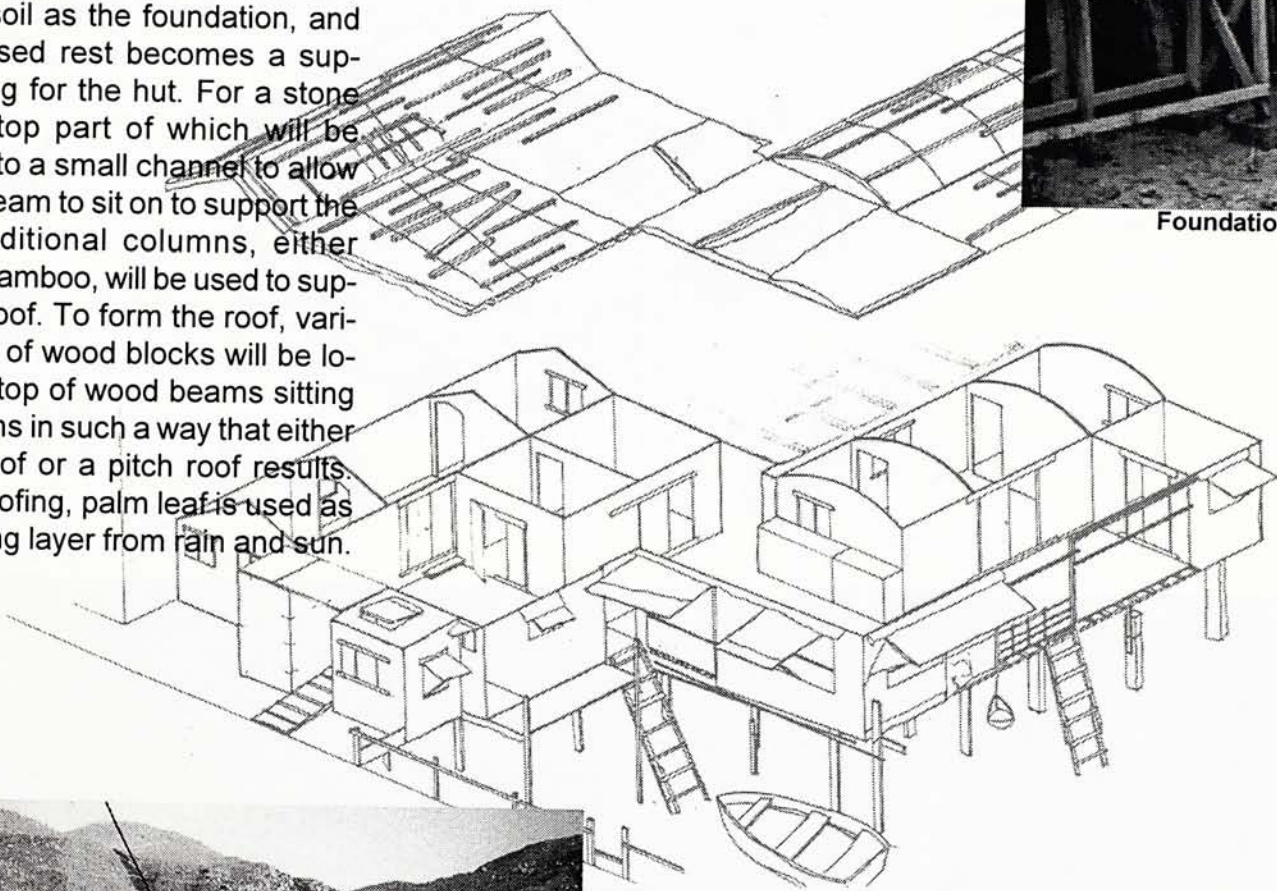
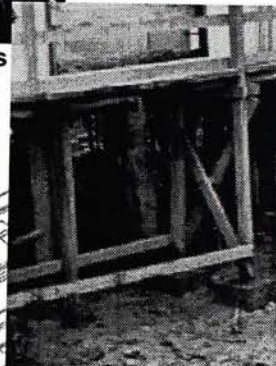
Roofing material-- palm leaves



Primitive Stilt Homes



Foundation



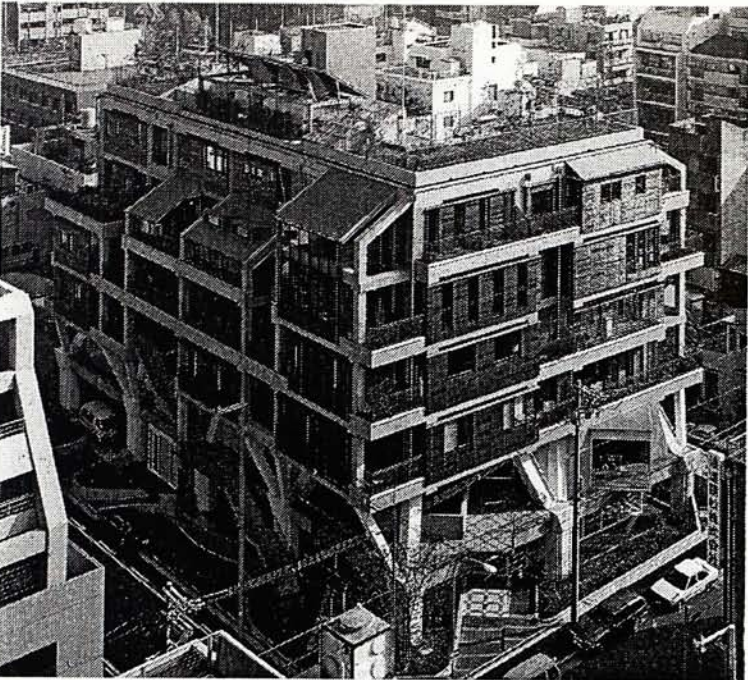
Isometric of the cluster of 2 families



Present 2-storey height Stilt Homes



2.3.2 Precedents



**Precedent I**

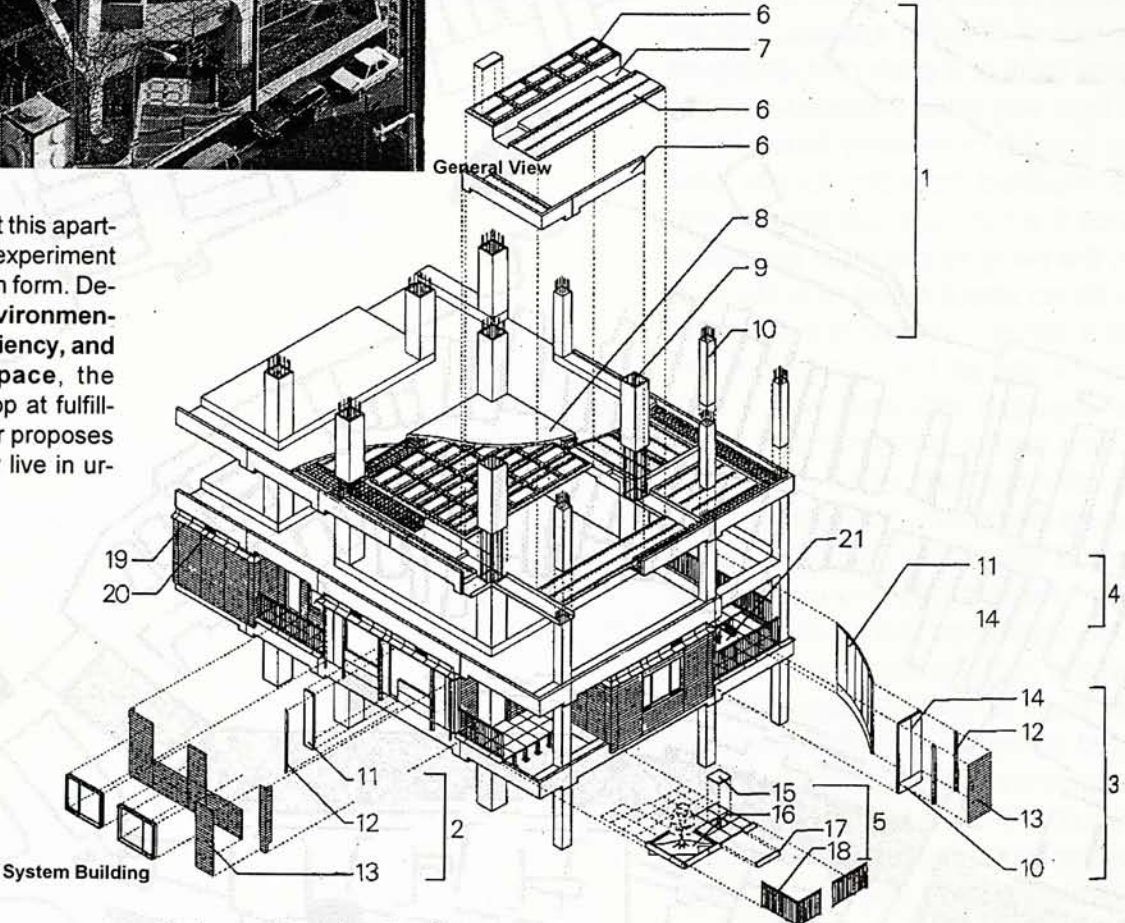
**Osaka Gas Experimental Housing NEXT21**

**Osaka, Japan**

**Committee for the Osaka Gas NEXT21 Project**

**Supervised by YOSITIKA UTIDA and the SYU-KOH-SHA Architectural & Urban Design Studio**

The Osaka Gas Company built this apartment building in Osaka as an experiment in collective housing and urban form. Designed around themes of **environmental preservation, energy efficiency, and providing ample living space**, the project was not content to stop at fulfilling functional needs but rather proposes to look realistically at the way live in urban



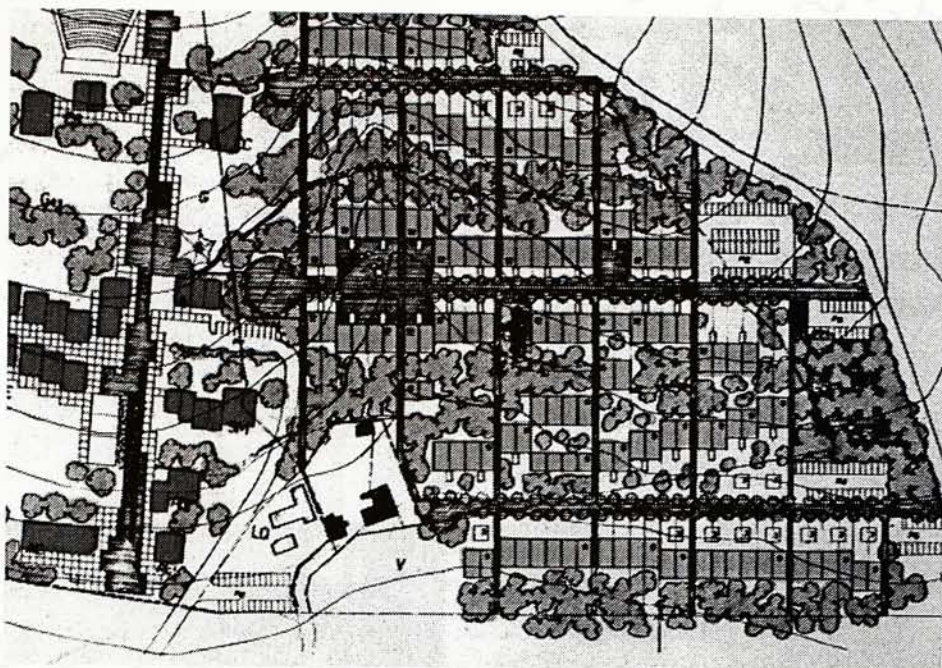
Design and construction have been carried out in two stages, with **interior fit-out (infill)** made independent from **structure (skeleton)**, which is expected to have a much longer life-expectancy. This process makes possible the development of a "system building" replete with infrastructure. The infill is intended to follow a certain set of premises regarding such things as building materials, location of exterior walls, location and shape of openings such as windows and doors – even extending to mechanical equipment and appliances.

Within this framework, several architects participated in designing infill apartment units – eighteen in all – based on their own premises regarding lifestyle. Six months after the apartment building opened to the public, its research program was begun, collecting data on energy efficiency, environmental issues, and residents' lifestyles for use in housing developments in the near future.



Room301, Designed by Naomi Tachibana





## Precedent II

Il Rigo Quarter  
Corciano, Perugia, Italy

Piano & Rice & Associates

Client: City of Corciano

Master Plan

### An evolutionary house

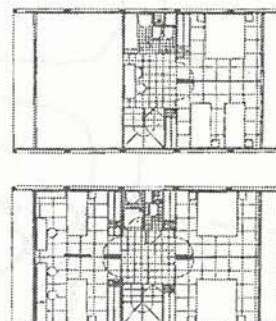
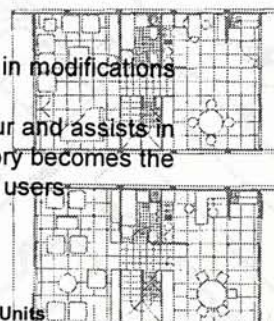
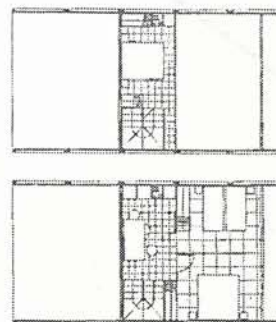
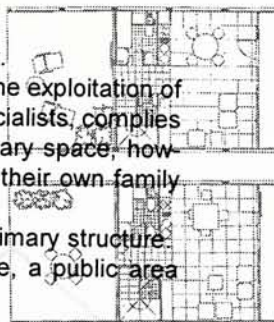
This quarter is a pilot application of the "evolutionary house" project. One hundred flats, built in such a way that houses are the result of the exploitation of a **primary and a secondary space**. The primary space, built by specialists, complies with **seismic and structural strength requirements**. The secondary space, however, can be equipped and transformed by the users according to their own family requirements.

Interior range from 56 to 131 square metres without affecting the primary structure. All houses are arranged in pairs, 6m high, facing, on the one side, a public area beside the public street and on the other a private green area.

### Active participation

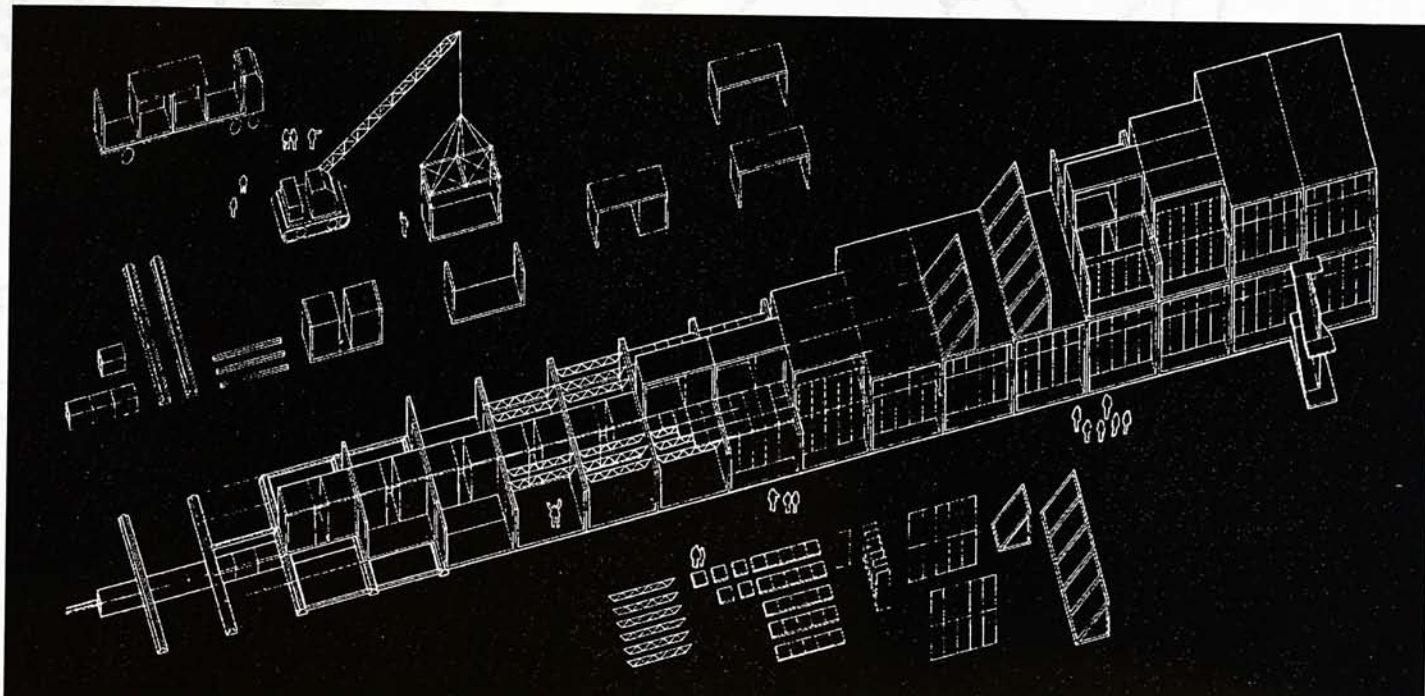
Participation in this project means that the users take an active part in modifications and finishes.

A local laboratory provides light technology for non-specialized labour and assists in users' decisions. Once the quarter has been completed, the laboratory becomes the core of maintenance system, carried out with the cooperation of the users.



Variated Units

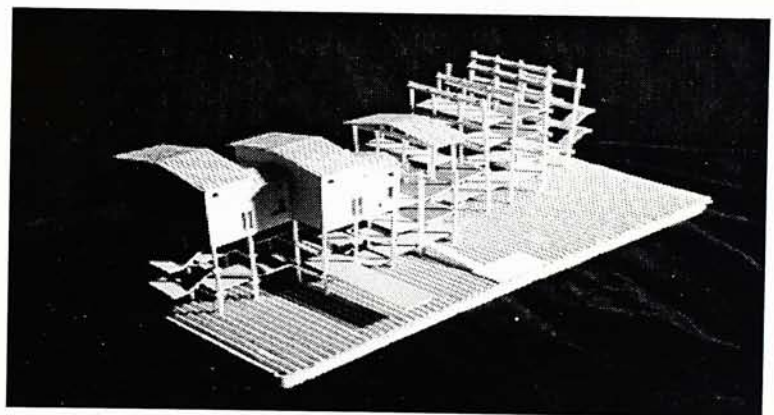
### Construction





### 3. Process

- 3.1 Organization & Zoning Period
- 3.2 Conceptual Stage
- 3.3 Schematic Design
- 3.4 Design Development
- 3.5 Design Deveopment I
- 3.6 Design Development II

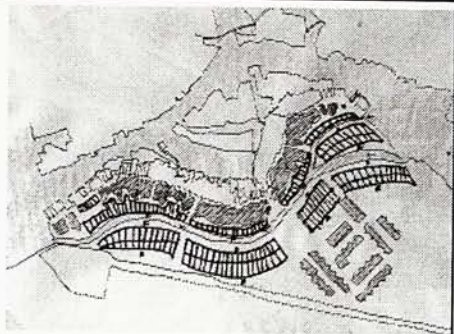


Preliminary Model

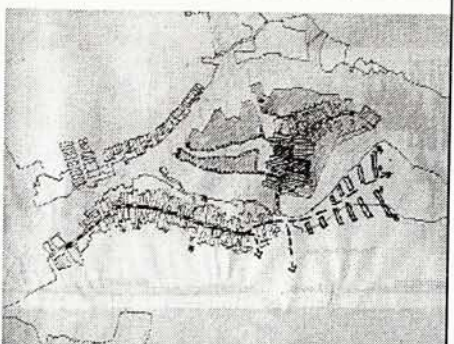


## 3. Process

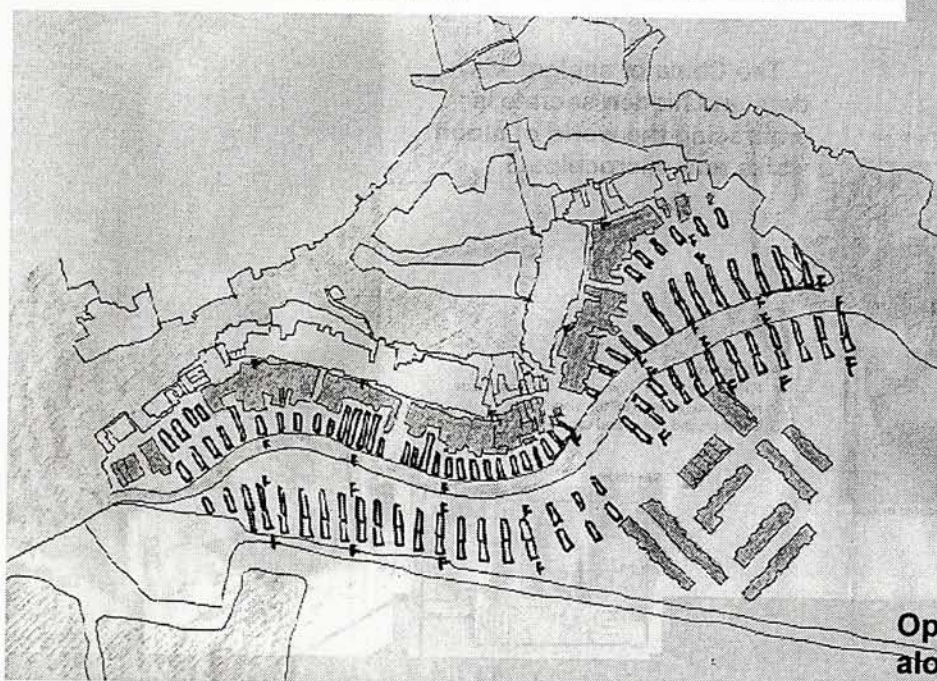
### 3.1 Organization & Zoning Period



Option 1: Canal system applied



Option 2: The centre of Tai O as an island

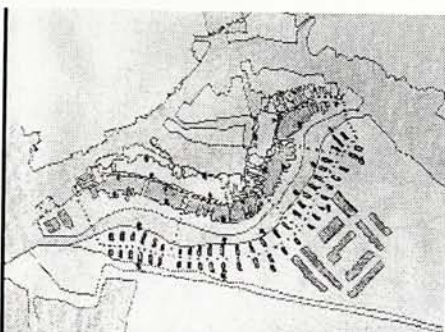


#### First Review:

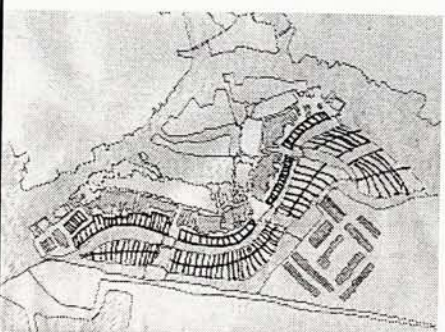
Option 3 is selected to develop. One river is applied to the site to rebuild the relationship between the land and the water...

Date: 30/10/96

Option 3: Dwelling units build along a river



Option 4: To use a river to divide old and new zone

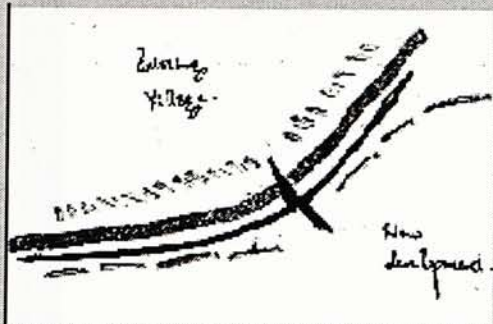


Option 5: To divide the site into many island

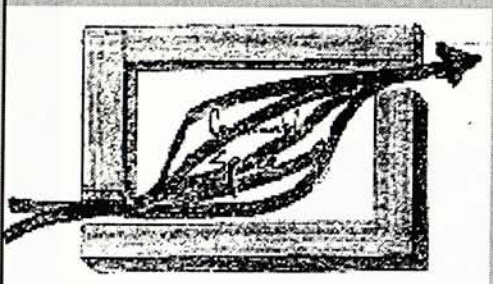


## 3.2 Conceptual Period

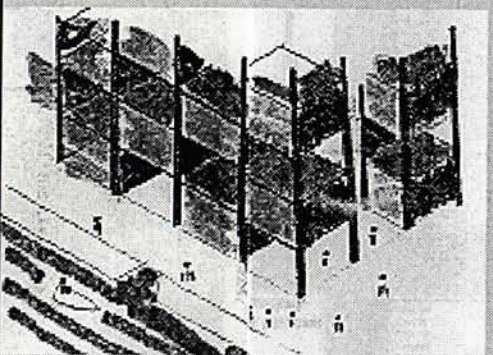
### Concept



To use the water to link up the open space



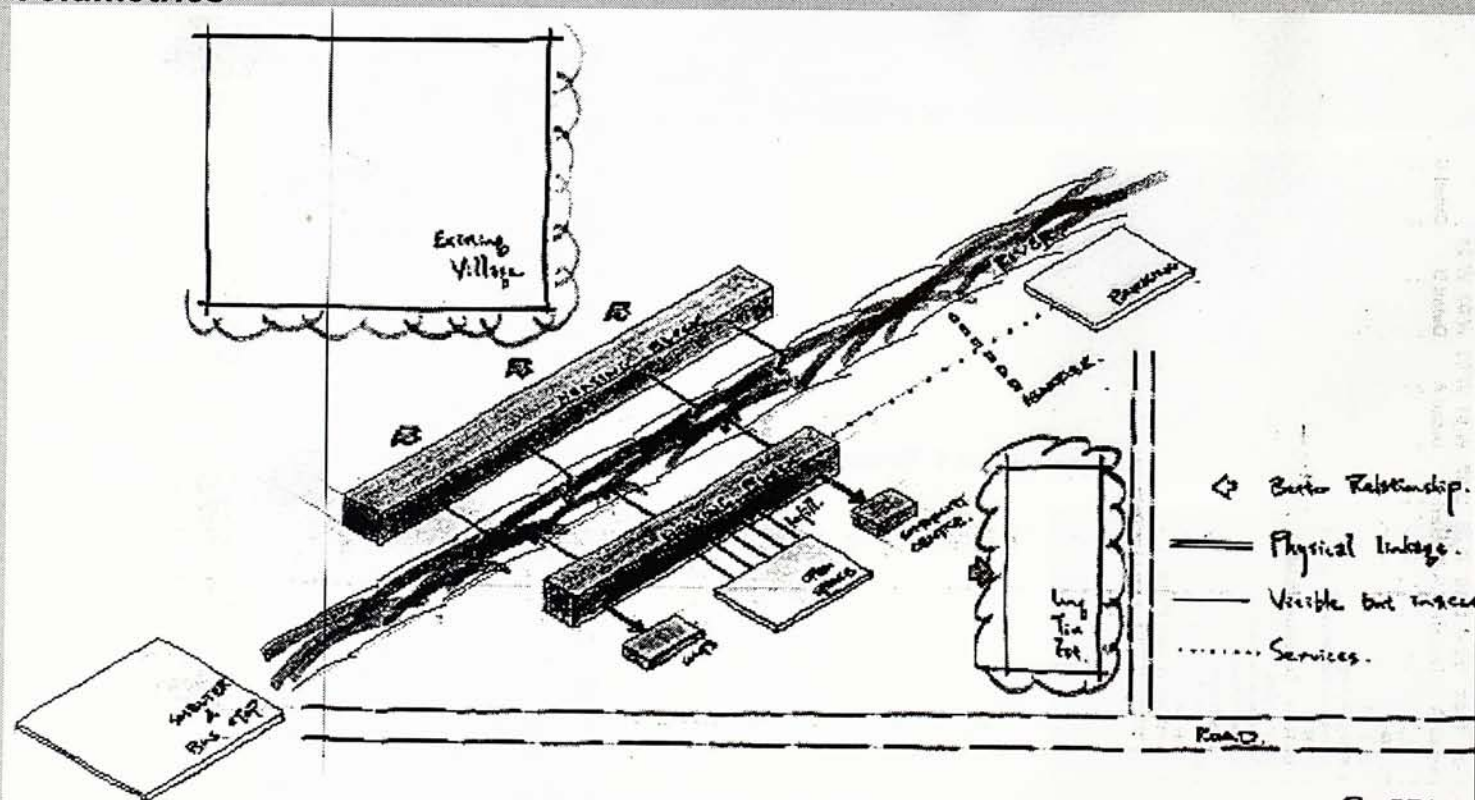
To use units organization to create the negative space



To use the "stack" concept to organize the vertical development

**Traditional organization** is considered as the site is developed from the edge between the village and new housing development.

### Volumetrics

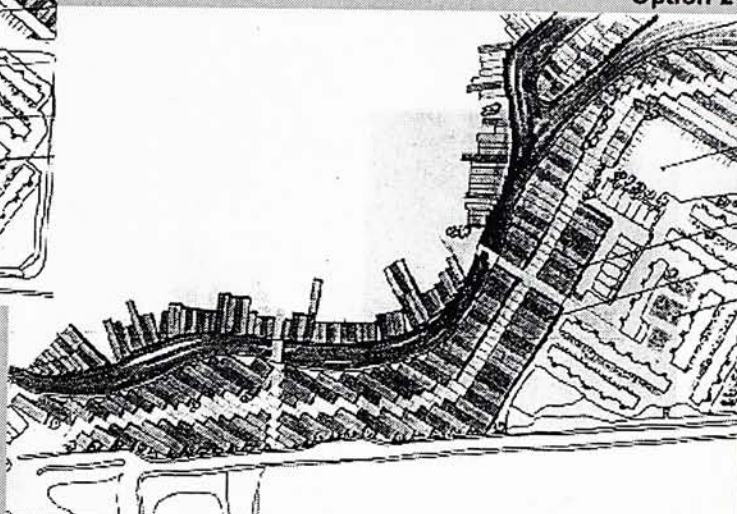


BUBBLE





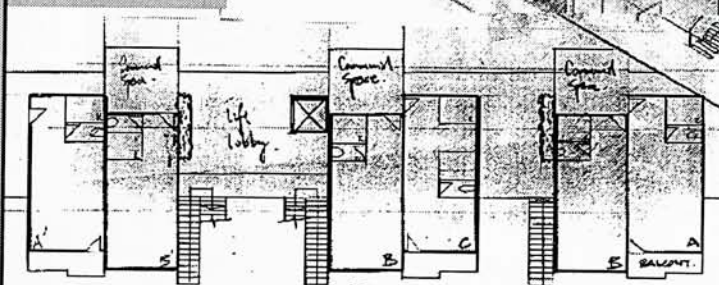
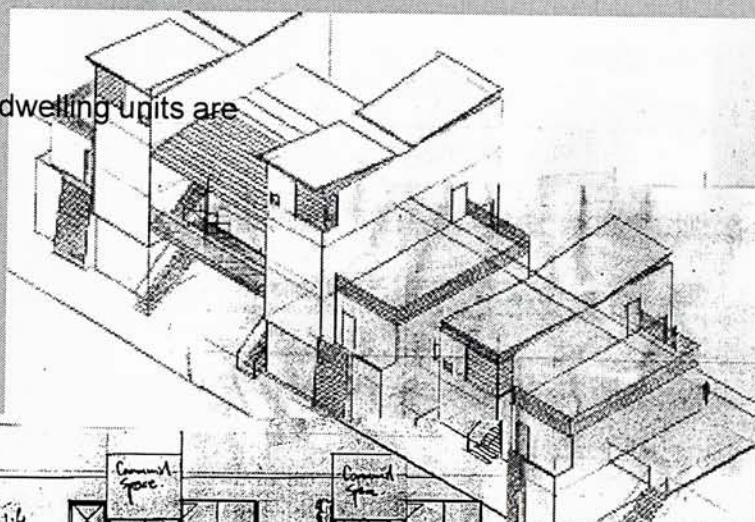
Option 1



Option 2

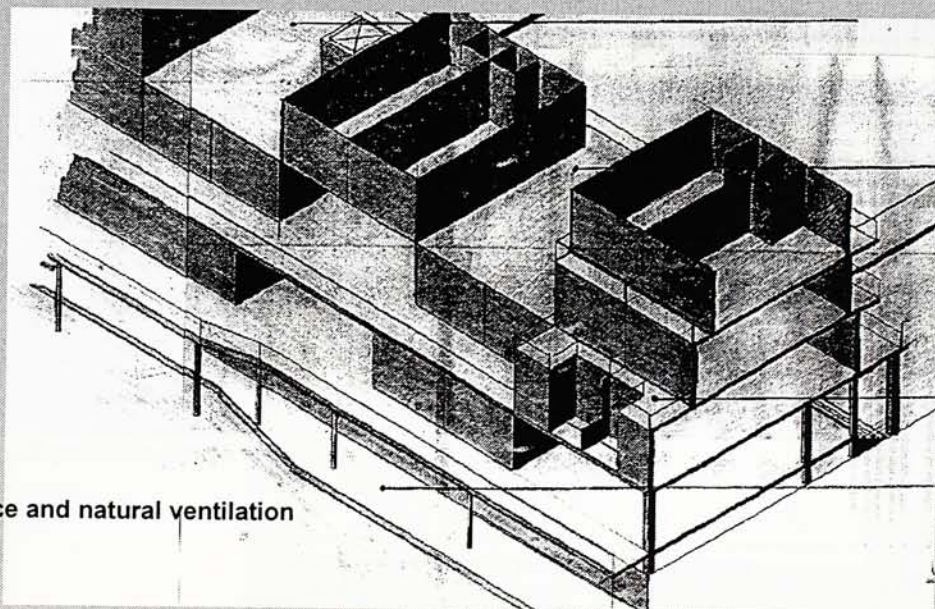
## Second Review

Site option about the units organization and the dwelling units are considered



Linear Organization: Lift Lobby as Communal Space

Date: 22/11/96



"Stack" form created for communal space and natural ventilation

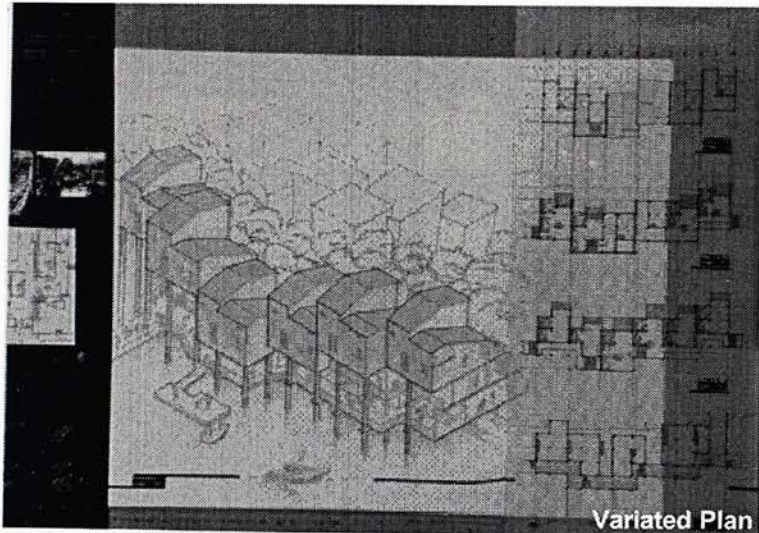
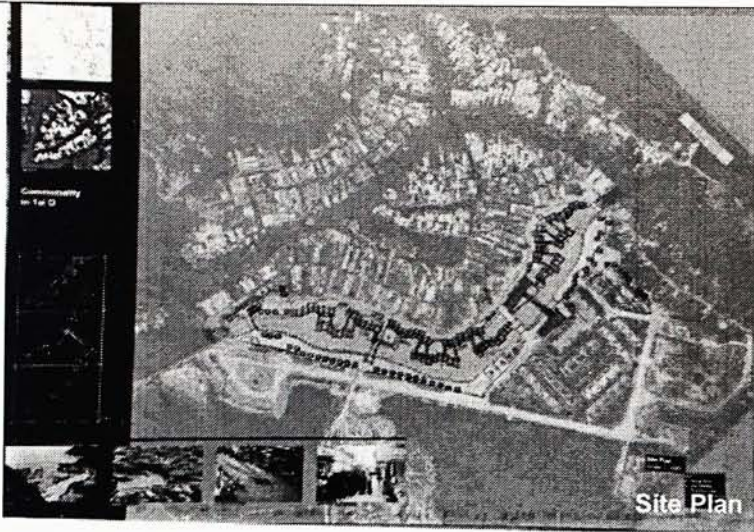


### 3.3 Schematic Design

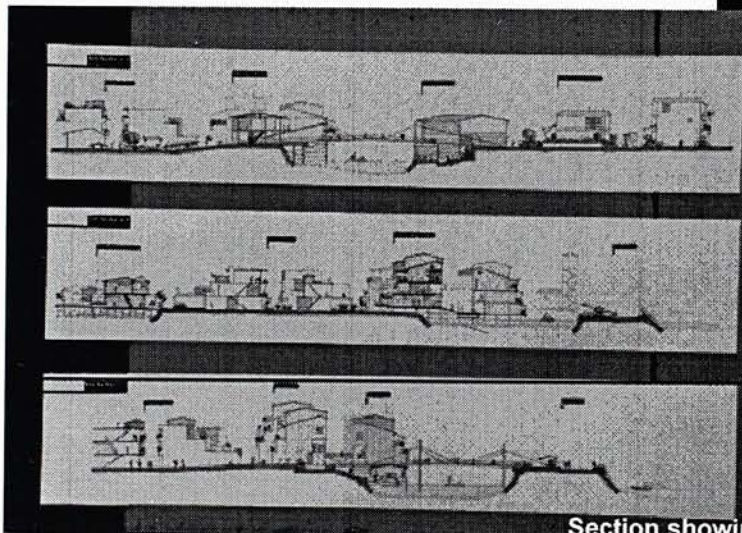
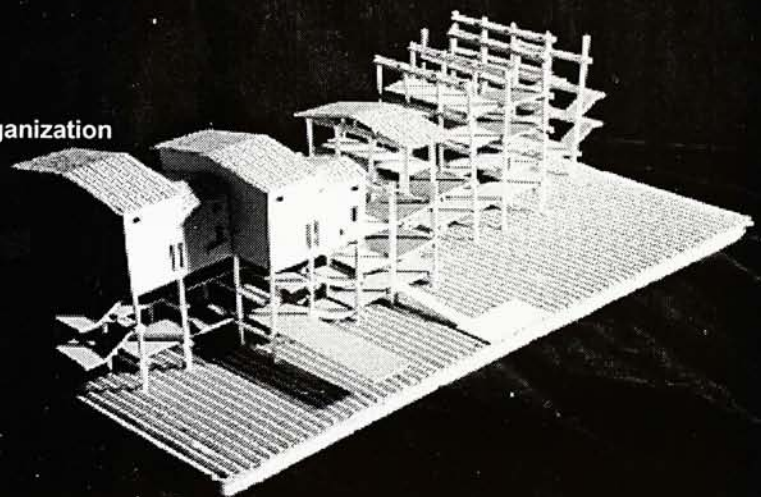
#### Third Review

At the end of the first term, one scheme is produced. **Permitted change and growth concept** is used and **prefabricated system** is applied to fulfil the need of the extension. Indeed, most of the part, e.g., prefabricated material and the rules for the residents to extend, are not yet well-developed.

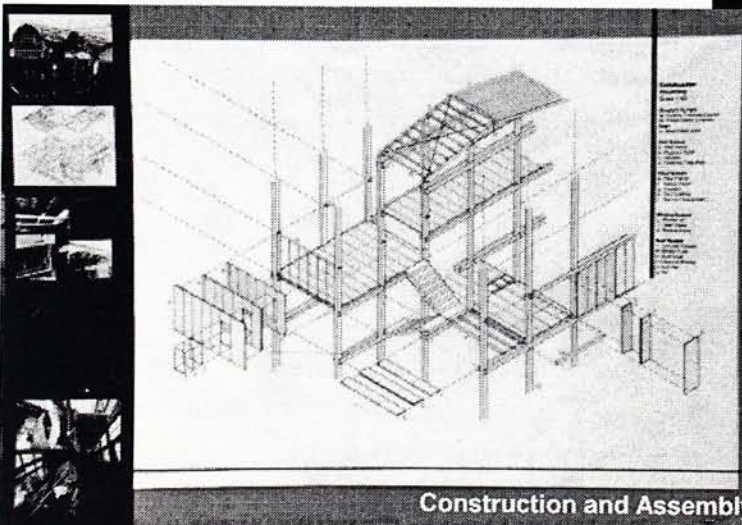
**Date: 13/12/96**



Model showing the random organization

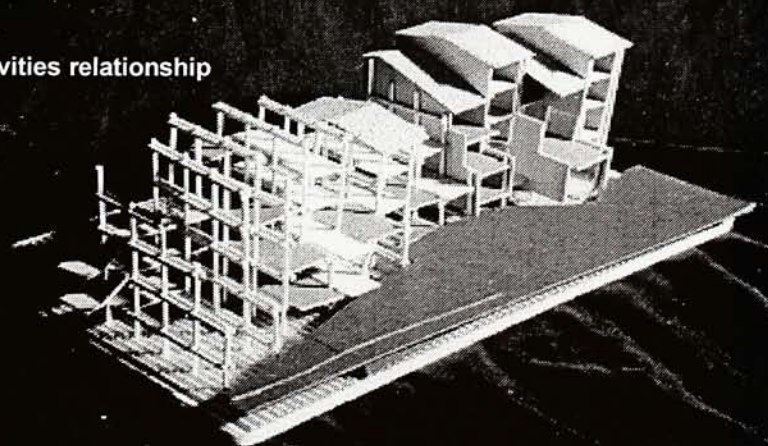


Section showing Activities relationship



Construction and Assembly

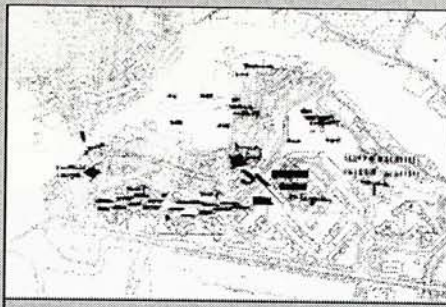
Model showing the stepped organization on the back elevation



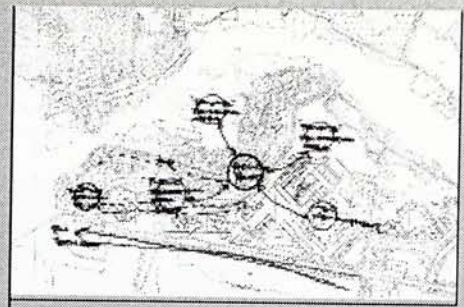




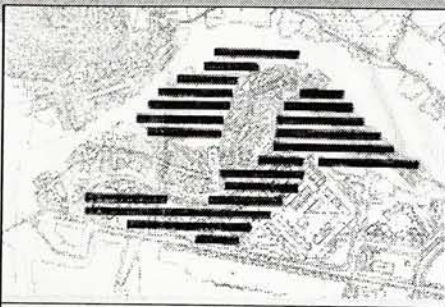
Site Plan & Future Development for the existing Stilt Homes



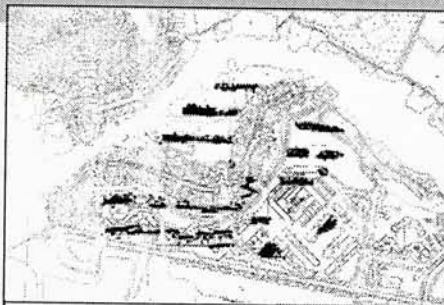
Function Space



Zoning & Organization



E-W Orientation -- Dwelling Pattern



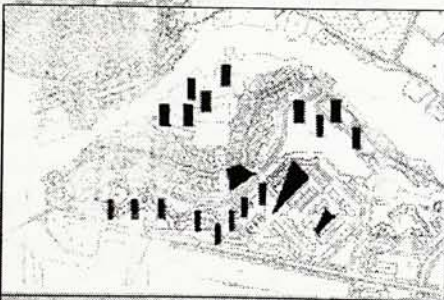
Landscape & Green Belt

### 3.4 Design Development

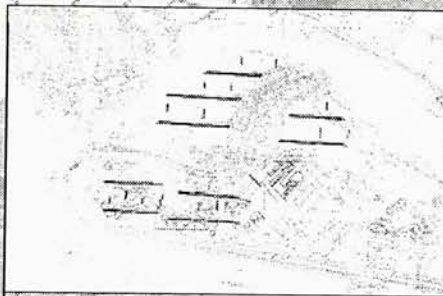
#### Fourth review

At this time, overall view of the project is considered again and again. The dwelling units, zoning, open space, services and so on are integrated at one time for this stage.

Date: 08/01/97



Communal Space for Public Activities



Circulation & Linkage -- Bridge & Road



### 3.5 Design Development I

#### Fifth review

At this stage, dwelling units are concentrated to design as a flexible and economic system. Also, the variation for different families is very important. Two rows of the blocks build along the canal and transitional or semi-public spaces are created by the surrounding buildings. Indeed, the flexible, varied system and the activities in the negative space are the key in such stage.

Date: 27/01/97

Sketch

2.713  
9  
4  
35.0

Dwelling Units Design Development

Dwelling Units Draft

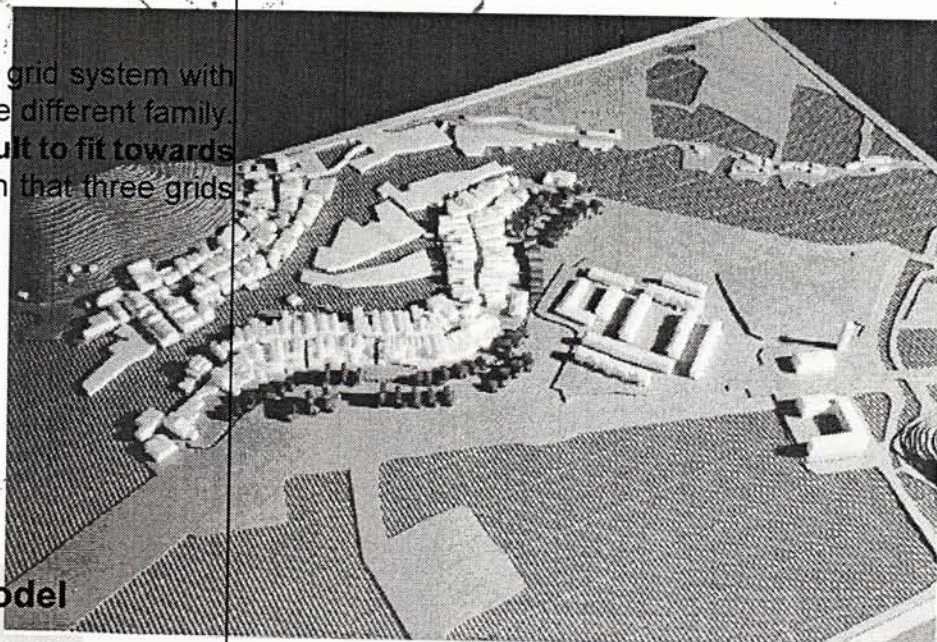
Sketch of Dwelling Units Organization





For site aspect, two rows of blocks build along the canal. Sometimes, some blocks setback to create "concave" space to provide some semi-public space. But the organization seems to be boring in the spatial organization...

For the dwelling units design, one grid system with service grid has been tried to fit the different family. However, one grid system is **difficult to fit towards all kind of family structure**. Such that three grids system is used later...



Study Site Model



3.6 Design development II

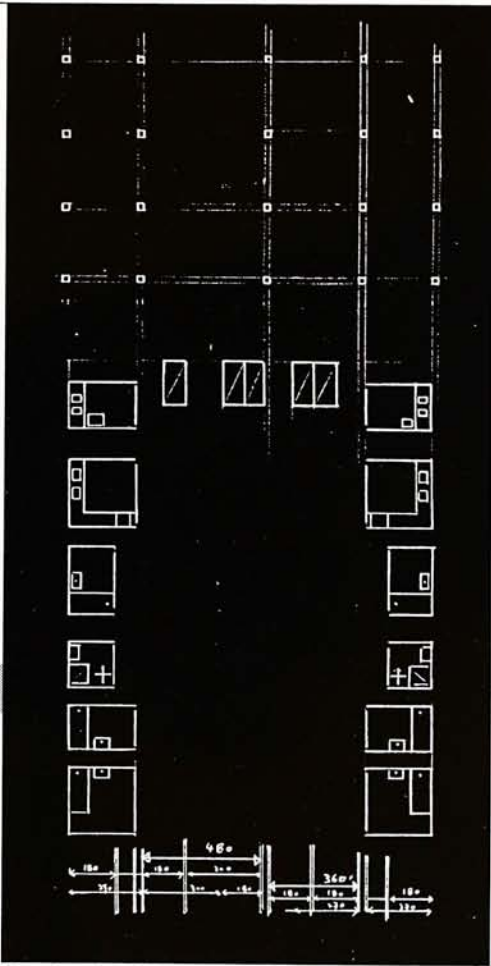
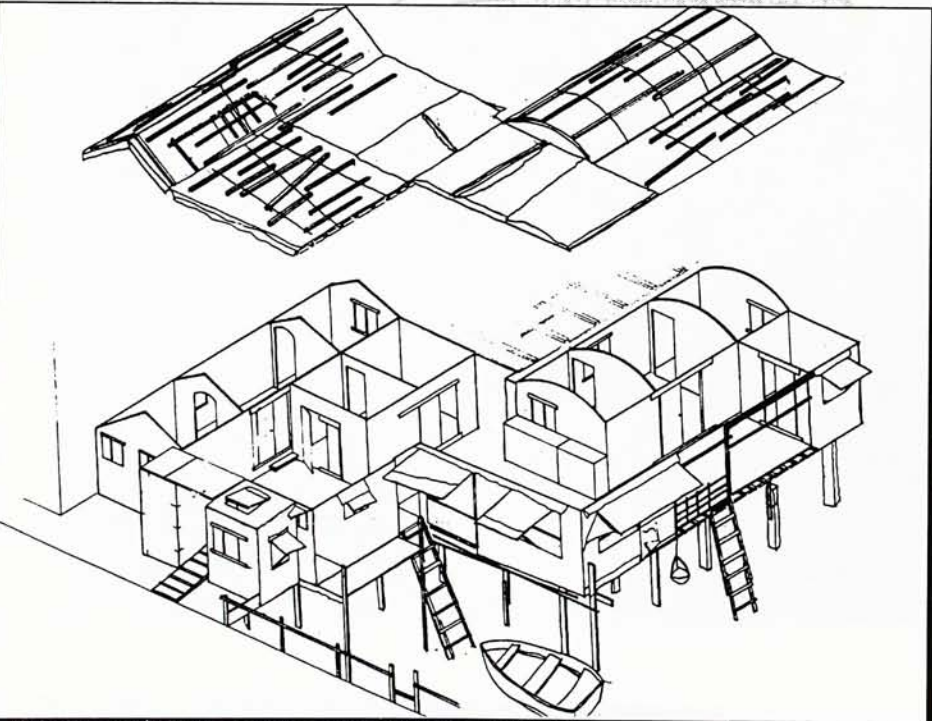
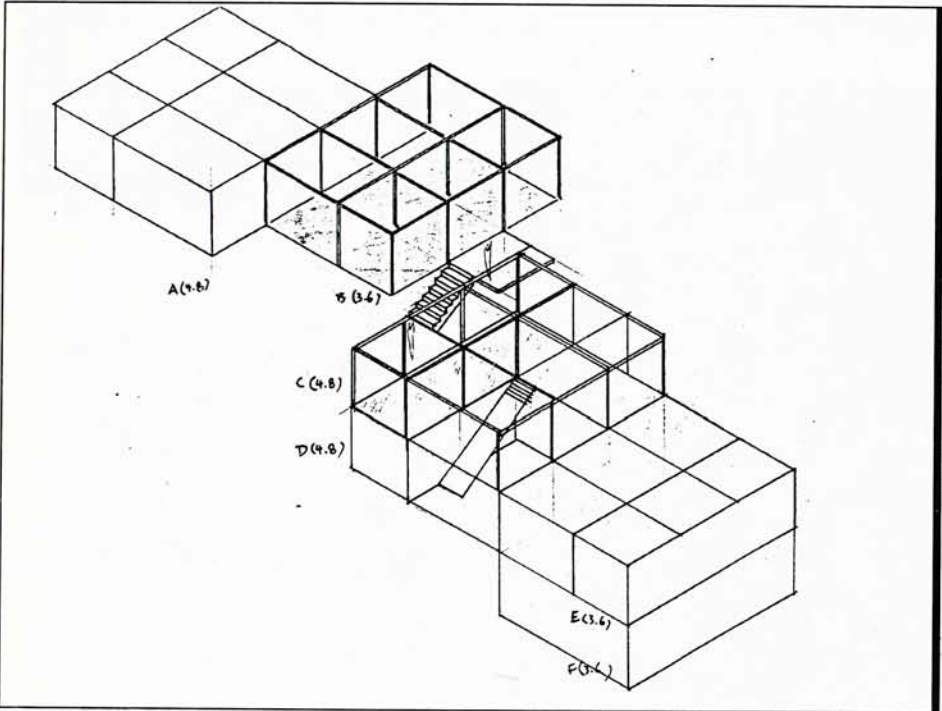
Sixth review

Three rows of living blocks is applied in site aspect and it is much interesting for creating the **semi-public space** as some buildings distribute in zip-zap and the canal flows inbetween the three rows.

Also, three grid system structure is used -- **2.7, 3.6, 4.8m**. For **2.7 grid setting, services** are mainly located there for toilet and kitchen. And then the 3.6 and 4.8 grid setting can be easily fitted towards the furniture, e.g., beds and cabinets.

And then, it is easy to fit to the enclosure setting. A assembly system is set for the opening incase of different needs of different family structure.

Date: 17/02/97



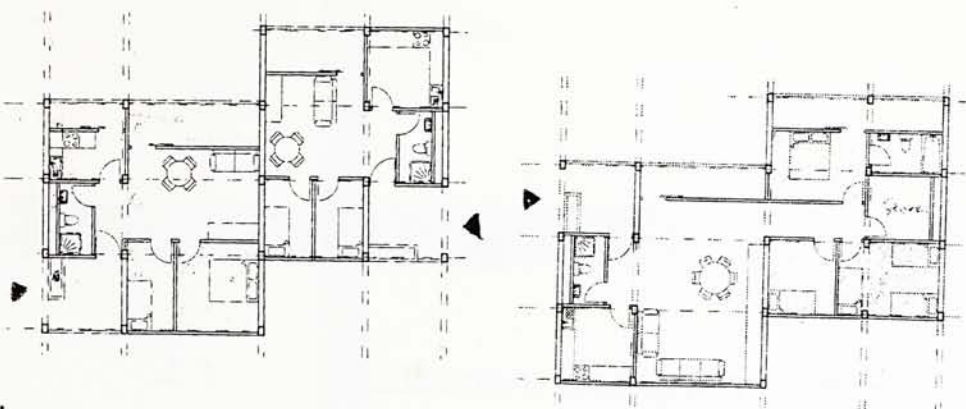
Study of different layout/ grid for different case

Grid Setting in 3 Kinds of Grid

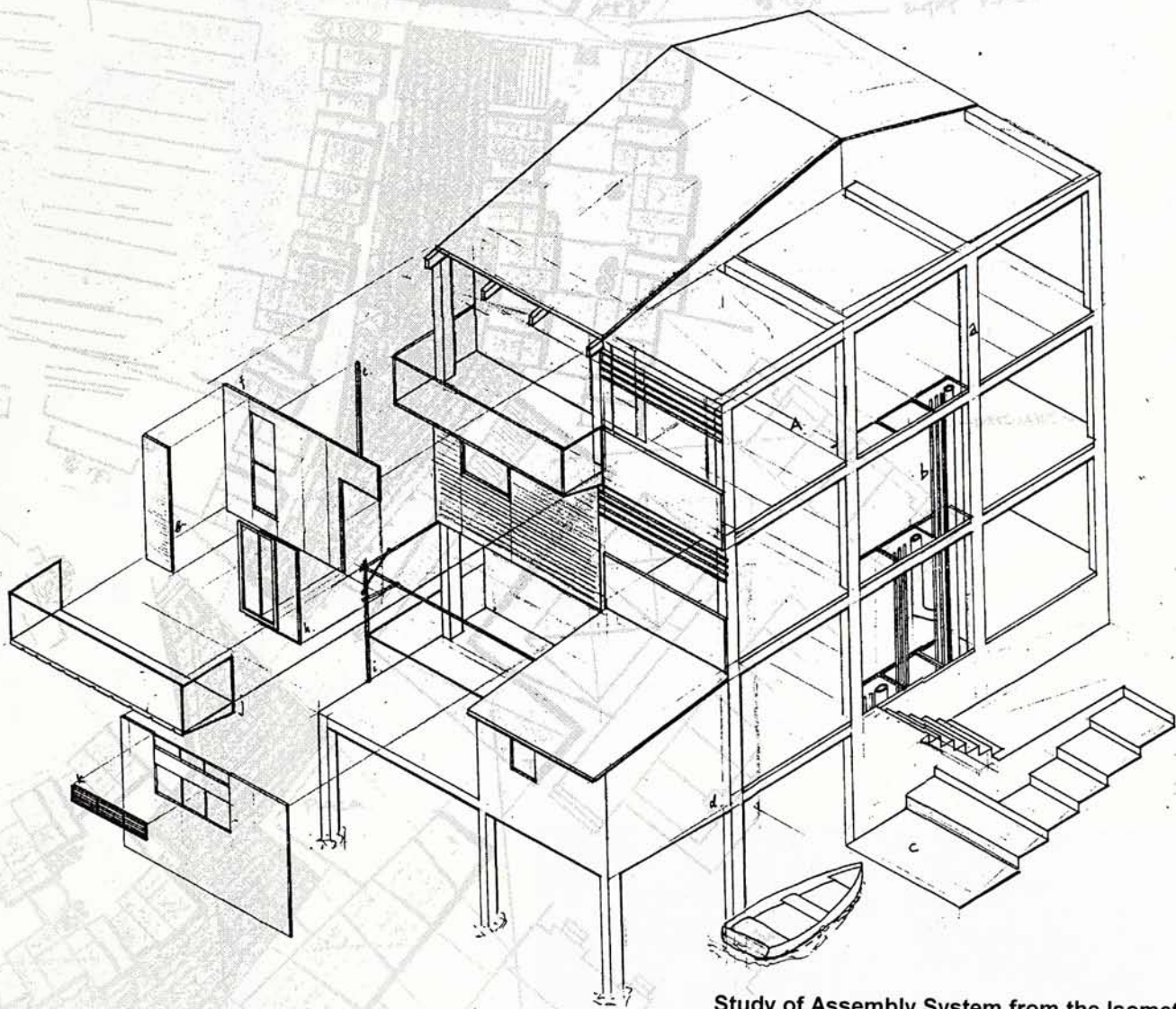
Traditional Organization of Stilt Homes  
in Tai O



One of the Varied Plan for Two Family

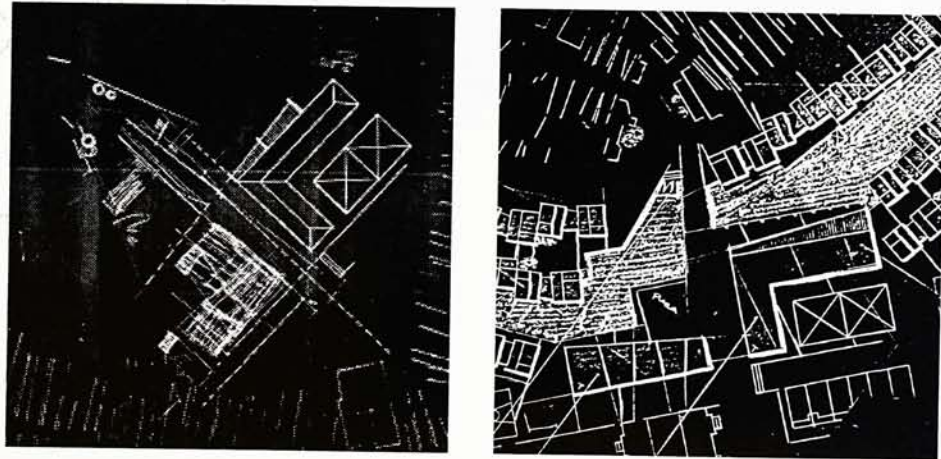


One of the Varied Plan for One Large Family



Study of Assembly System from the Isometric

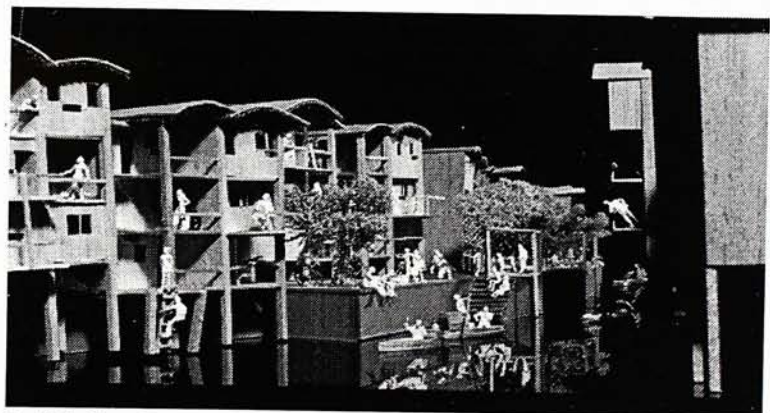
Sketches and Open Space Design





## 4. Final Project

- 4.1 Settlement Design in 4 Level
  - 4.2 Site Planning
  - 4.3 Methodology: Diagram of Dwelling Units Formation
    - 4.3.1 Resident's Requirement
    - 4.3.2 One Man in Tai O
  - 4.4 Cluster Level
    - 4.4.1 Cluster
    - 4.4.2 Activities in the Cluster
    - 4.4.3 Cluster Level
  - 4.5 Open Space Level
  - 4.6 Details & Construction
  - 4.7 Special Studies: Material
- 

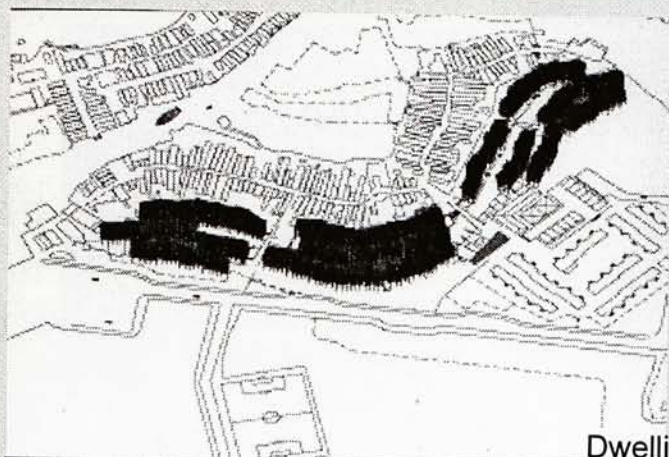


Model showing the relationship between the water and the land



## 4. Final Project

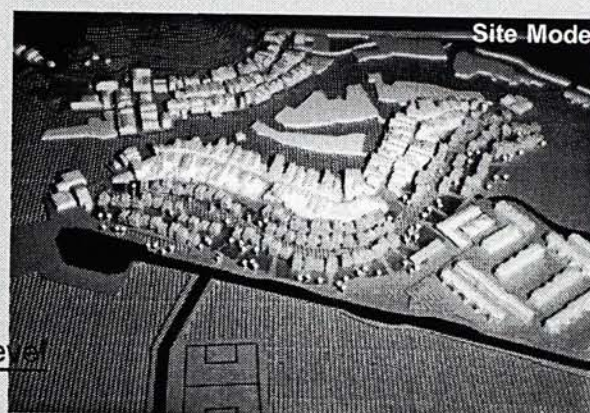
### 4.1 Settlement Design in 4 level



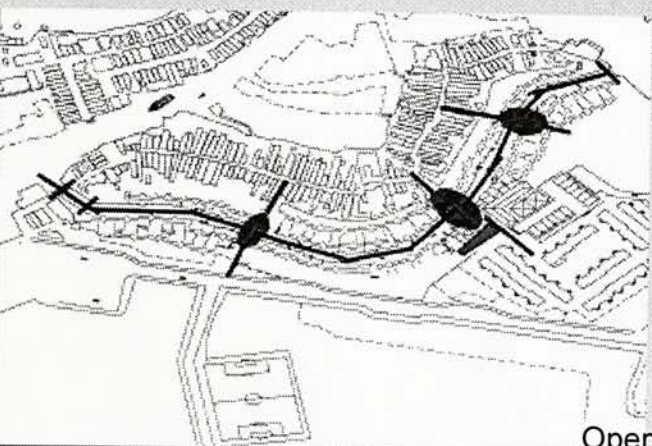
Dwelling Unit Level



Cluster Level



Site Model



Open Space Level



Community Level



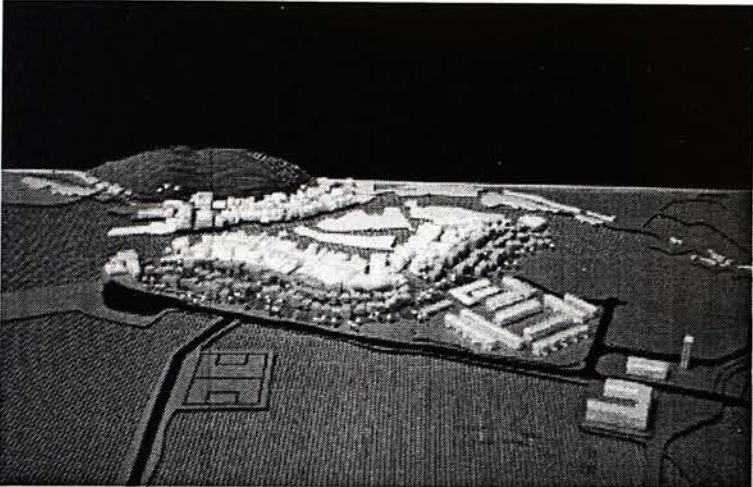
Cluster Model



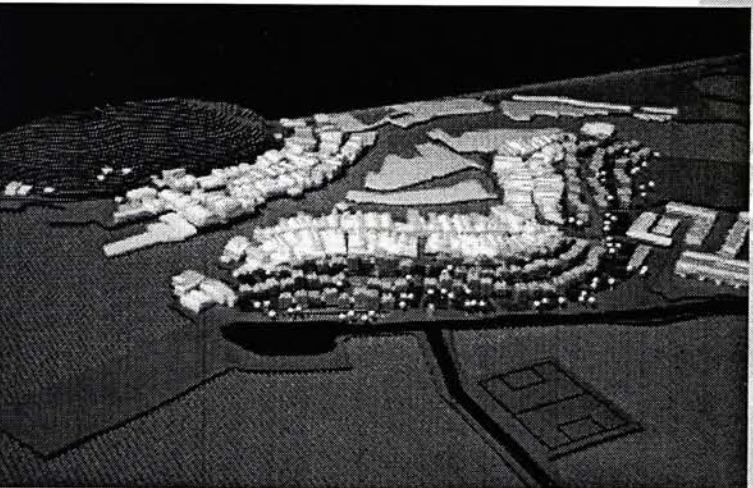
Open Space Model



4.2 Site Planning



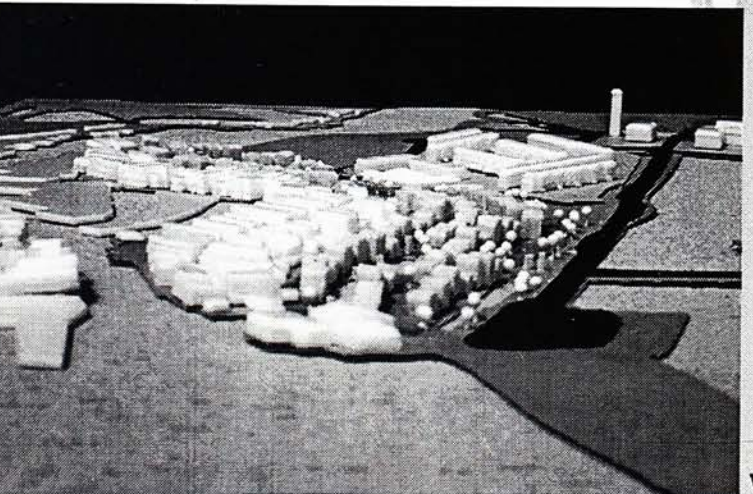
Overall View



View from the mouth of  
Tai O River



View from the East



View from the West

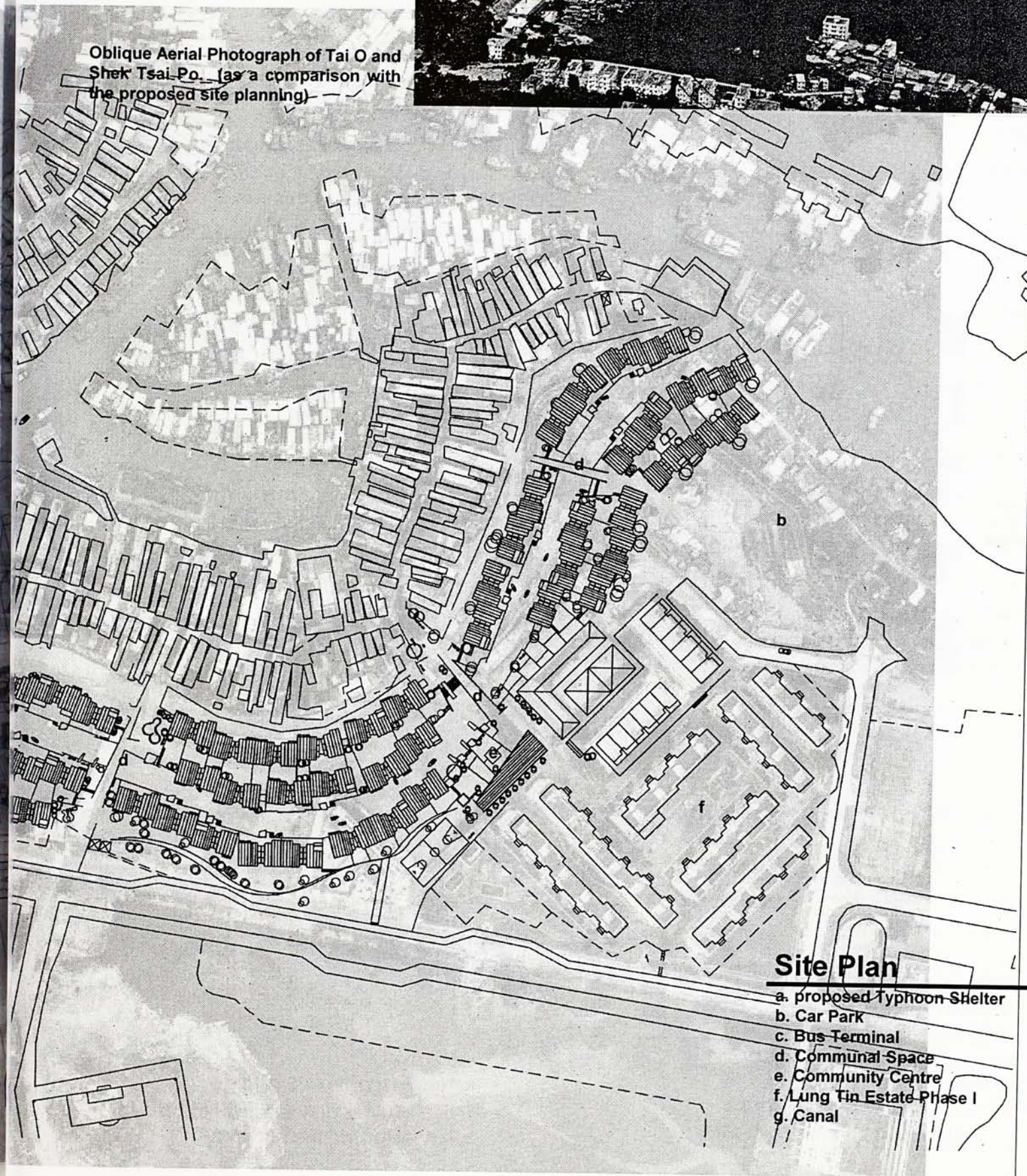
Site Concept

- To follow the existing layout of the old village and to mix up the new housing estate (Lung Tin Estate)
- To use the open space as the communal space and the path
- To follow the traditional settlement clusters which is formed by the dwelling units randomly.





Oblique Aerial Photograph of Tai O and Shek Tsai Po. (as a comparison with the proposed site planning)



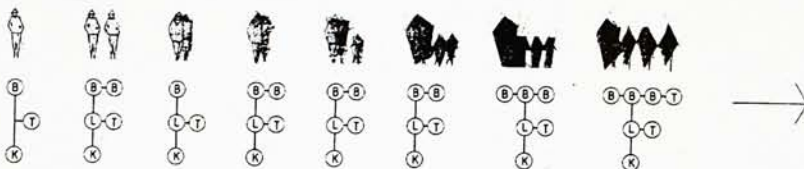
### Site Plan

- a. proposed Typhoon Shelter
- b. Car Park
- c. Bus Terminal
- d. Communal Space
- e. Community Centre
- f. Lung Tin Estate Phase I
- g. Canal

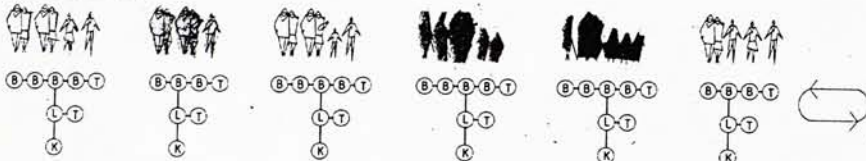


## 4.3 Methodology : Diagram of Dwelling Units Formation

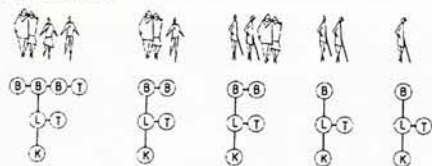
General Case



Sustainable Case



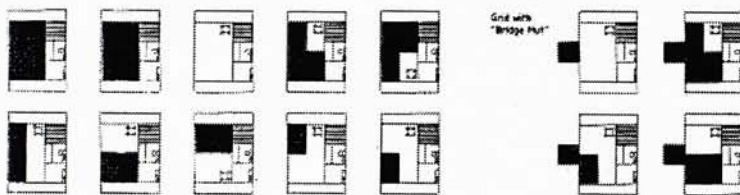
Decaying Case



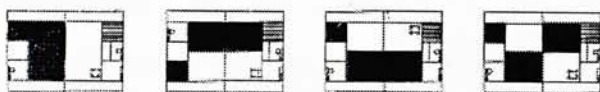
### Family Variation

- To analyse the family structure of Tai O residents in decay /sustainable situation.

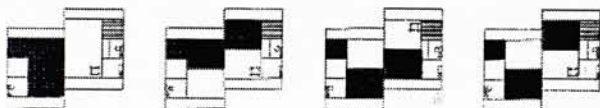
One Grid



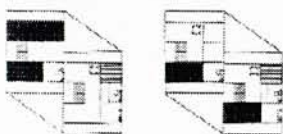
Two Grids



Shuffled Grids

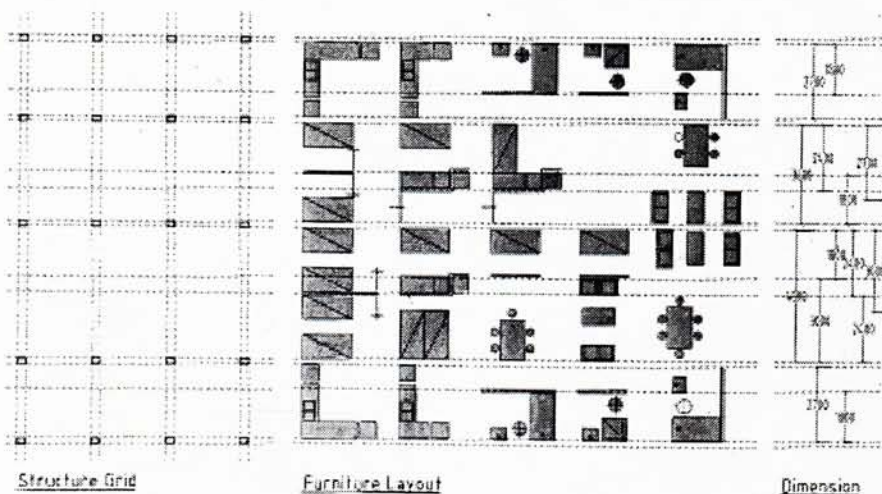


Two Levels



### Plan Variation

-In different requirement of different family structure.



Structure Grid

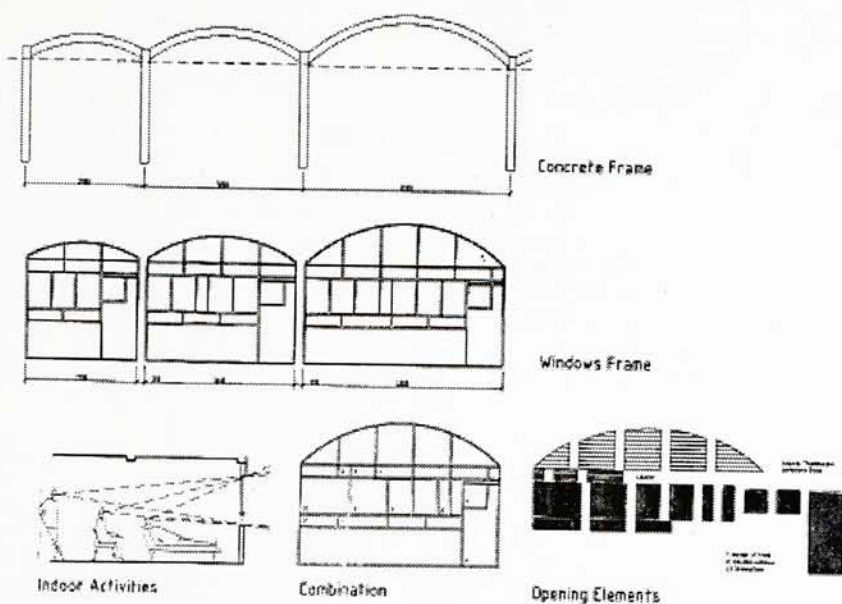
Furniture Layout

Dimension

### Furniture Layout

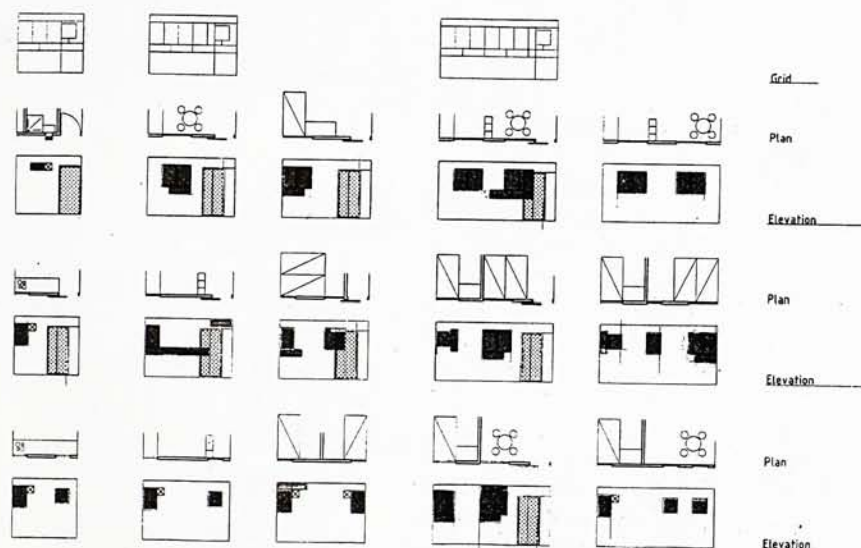
-To design the size of the grid to fit toward the furniture





### Element Combination

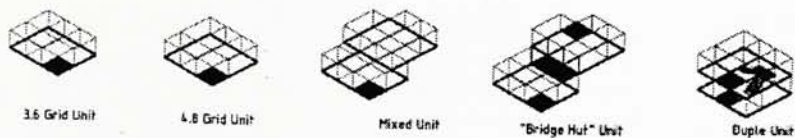
-For different requirements, in different height of openings.



### Elevation Variation

-For different activities behind the elevation, in different elevations requirements

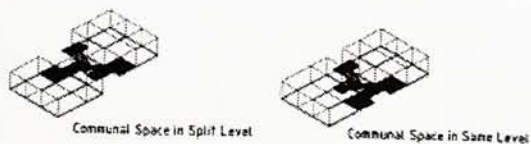
#### Unit Variation



#### Balcony Variation



#### Stair Variation




### Grid Setting


-For the extension of one family and the communal requirements, in different combination of grids. The balcony can be added, the communal spaces are located for each family and in some case, the "bridge hut" can be added.




4.3.1 Resident's Requirement (Same time in different variations)





**a1. Single**  
Small Kitchen; No bedroom







**d2. Family with two children and baby**  
Expanded "hut" as one bedroom  
One small balcony only for drying clothes



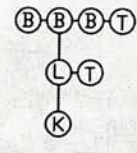



**a2. Brother**  
One share room; Store



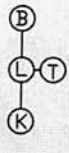



**e. Family with three youth**  
Three bedroom on one grid block; larger living room ; longer balcony; larger store



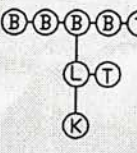



**b1. Couple**  
One bedroom;  
Living room with canal view



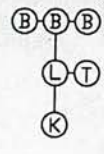



**f. Two generation with three children**  
Four bedroom and one guest room for their relations; larger store for fishing equipment



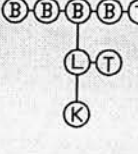



**b2. Family with three children**  
Small living room; three bedroom around the living room & linking the balcony







**g. Family with one elderly three children**  
Three bedroom on one side grid block; longer living room; one longer balcony & one additional balcony; larger store for fishing equipment







**c1. Family with two children**  
Expanded "hut" as one bedroom; Bedroom on one side; One store for fishing equipment



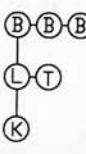



**h. Family with two children & baby**  
Two level unit; Living room on the lower part; Two bedroom facing street on the upper part; one large roof garden



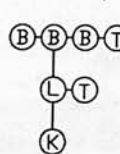



**c2. 3 Single**  
Larger kitchen; 3 independent bedroom with expanded "hut"






**i. Two generation with children**  
Living room and dining room in different level; Bedroom on two level in one side view; smaller balcony





**d1. Couple with baby**  
One bedroom; one baby room  
Living room with both side view

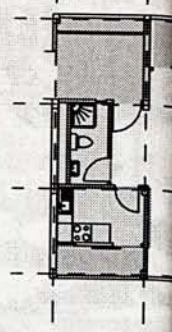
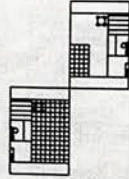


**Legend:**

- B Bedroom
- L Living Room
- K Kitchen
- T Toilet

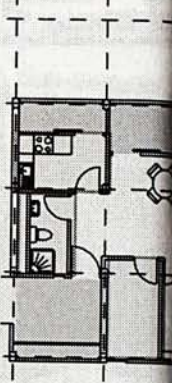
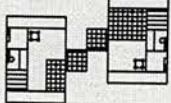
**a1 + a2:**

a1. Single  
a2. Brother



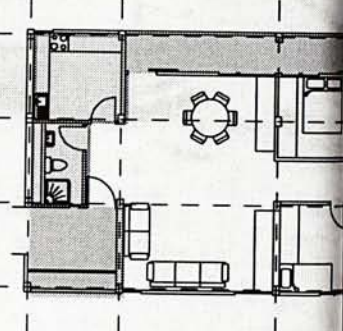
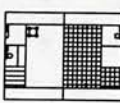
**c1 + c2**

c1. Family with two children  
c2. 3 Single



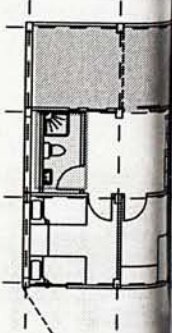
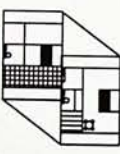
**e**

e. Family with three youth

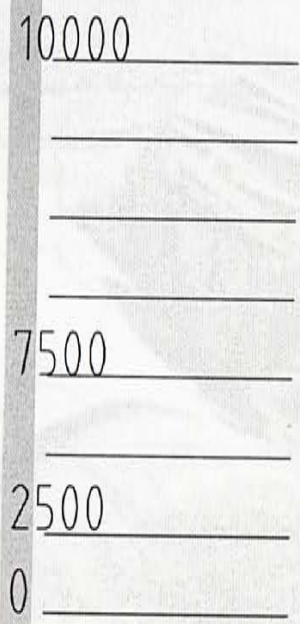
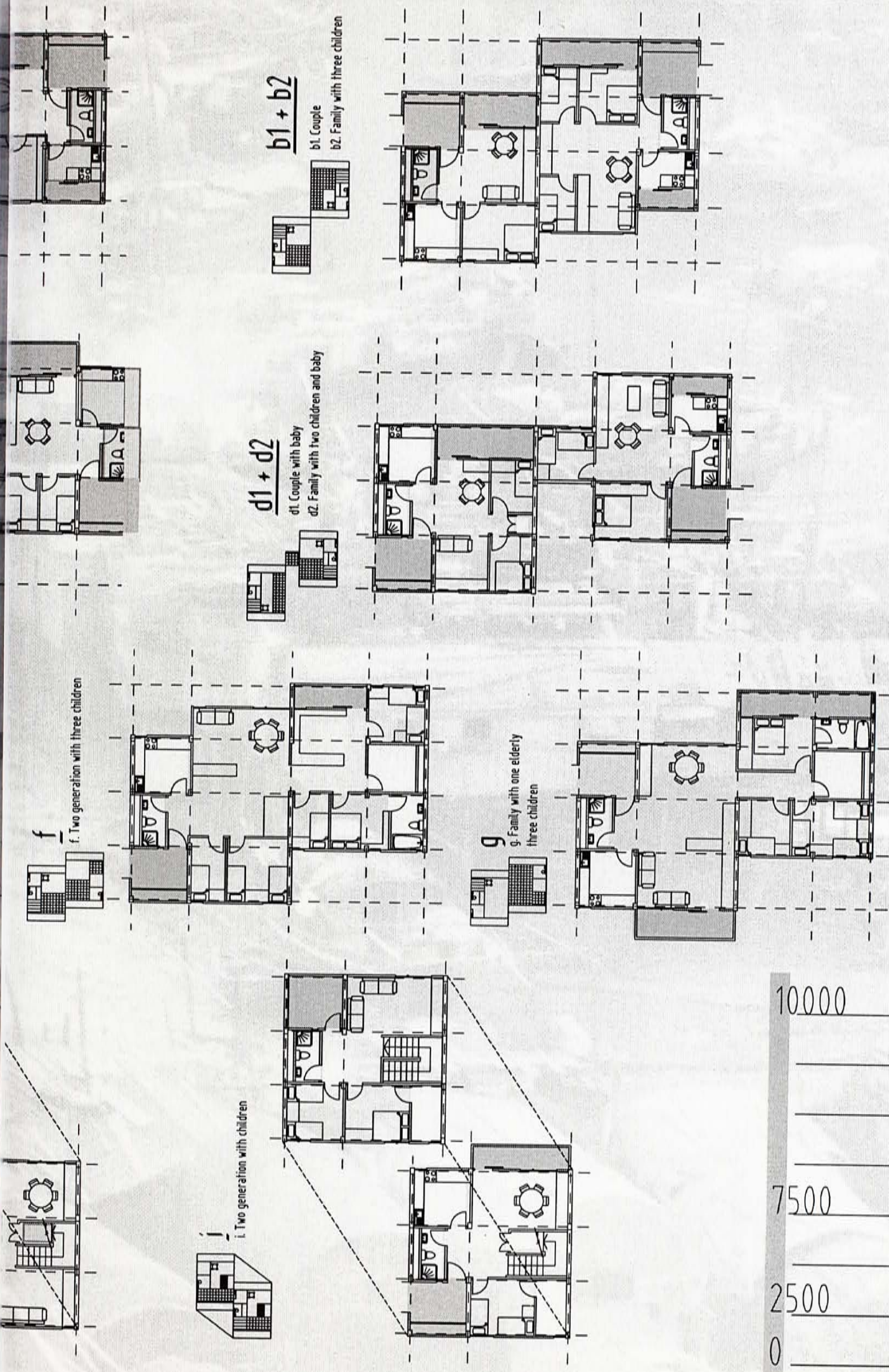


**h**

h. Family with two children & baby









4.3.2 One Man in Tai O (same place in different time)



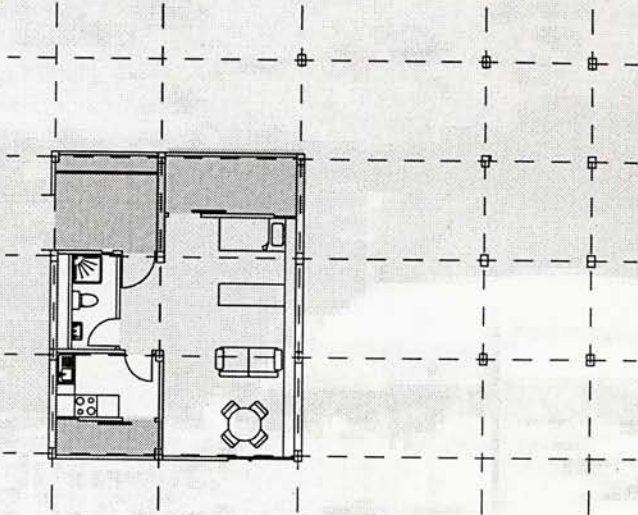
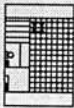
Name: Chen San  
Age: 24  
Status: Single  
Address: Block B, 2/F, 6, Row 2, Zone B,  
Tai O Experimental Housing, Tai O, H.K.  
Occupancy: Fisherman

Year: | Age: | Condition:



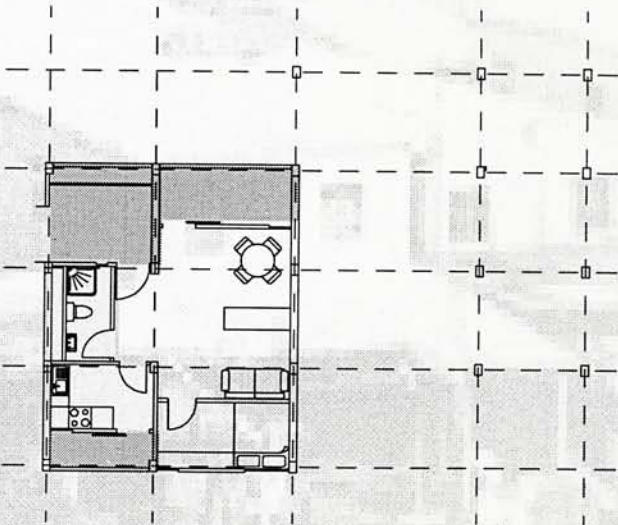
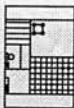
1997 24

Single  
Small Kitchen; No bedroom;  
One Balcony facing Canal



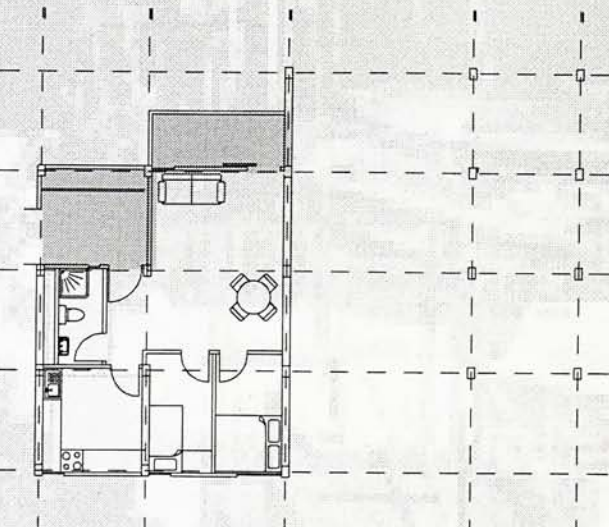
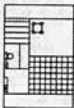
2001 28

Couple  
One bedroom;  
Living room with canal view

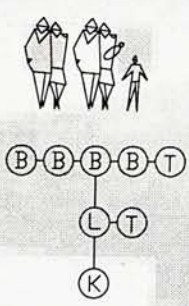


2013 40

Family with Two children  
Small living room; Two bedroom;  
Larger Kitchen;  
One Additional Balcony

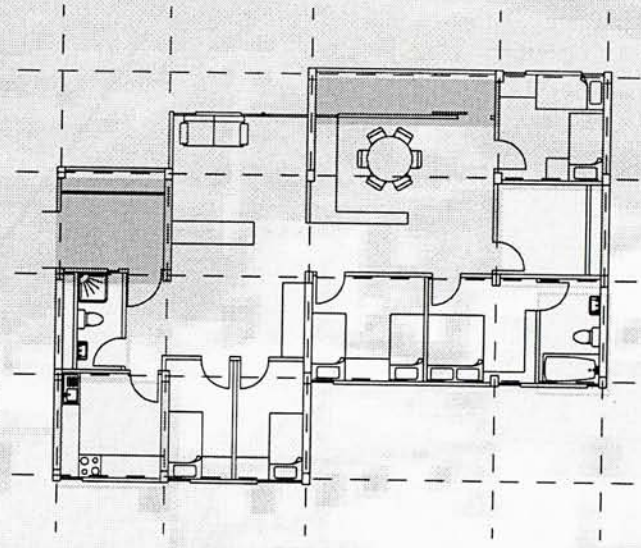
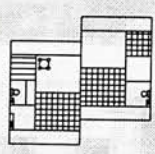






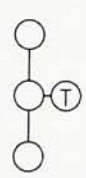
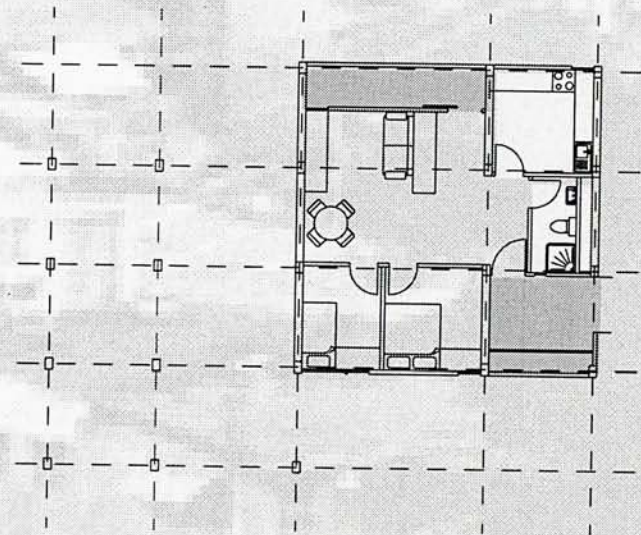
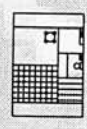
2031 58

Two generation with children  
Four bedrooms and one guest room  
for their relations; larger store  
for fishing equipment



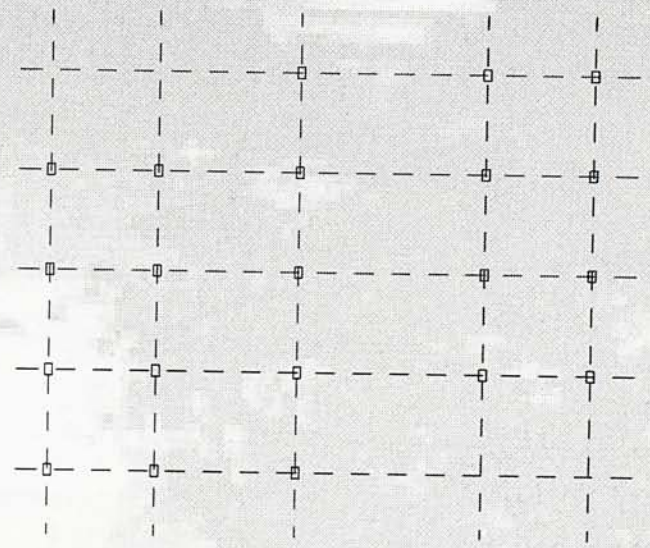
2038 65

Retired (Children move out)  
Two bedrooms with larger living room;  
One long balcony facing the canal



2047 74

Living with children  
Chen with his wife move out  
to live with children; Flat return to  
Housing Society



0  
1000  
3000

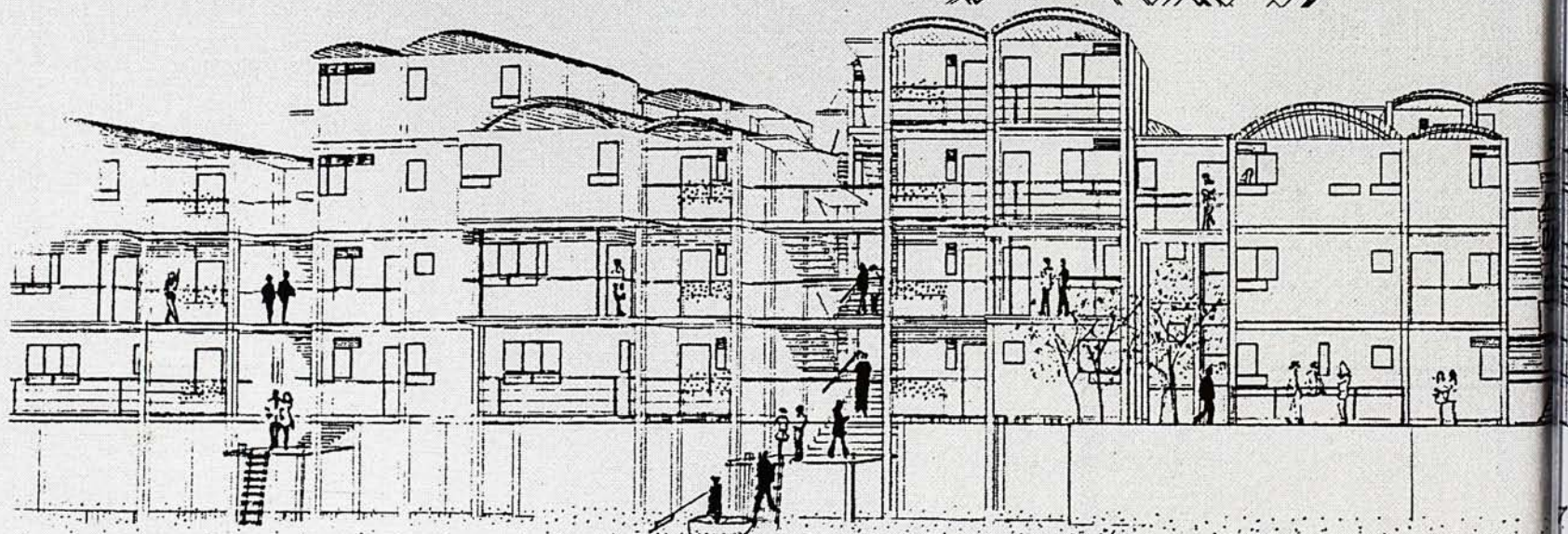
7000



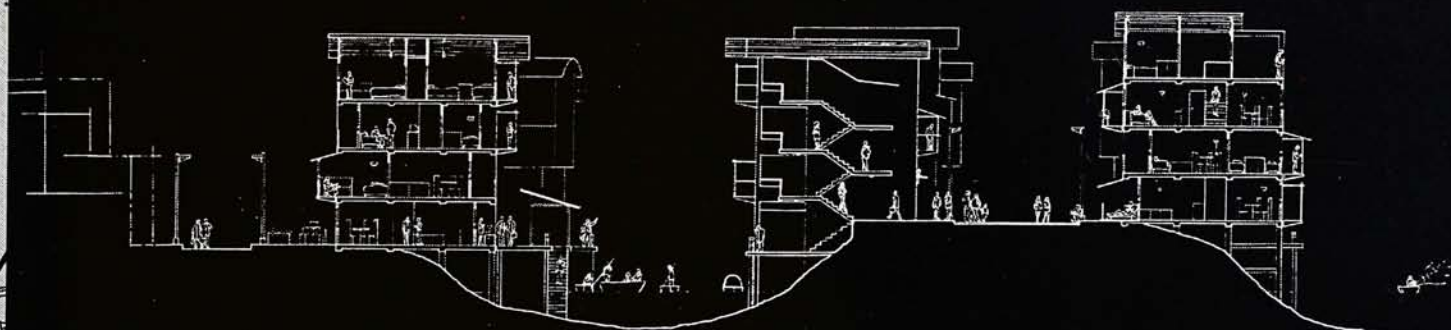
#### 4.4 Cluster level



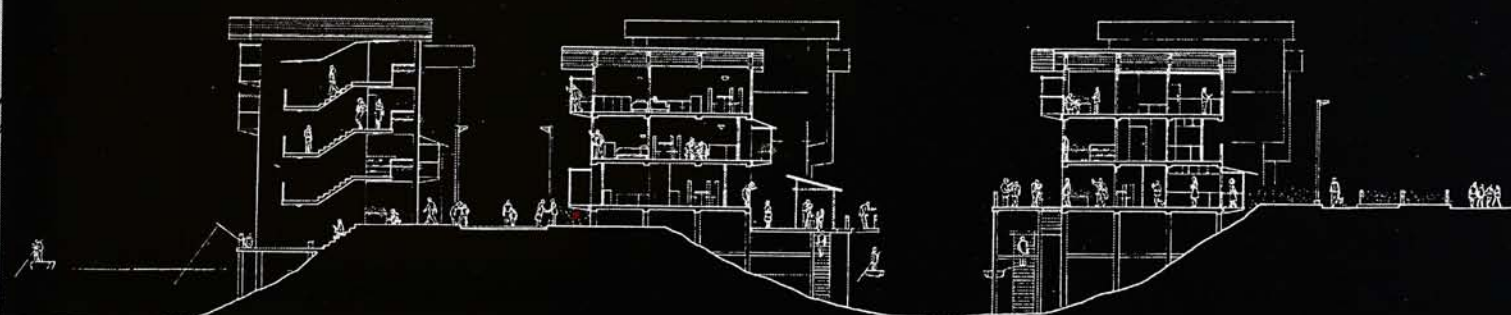
Cluster Plan







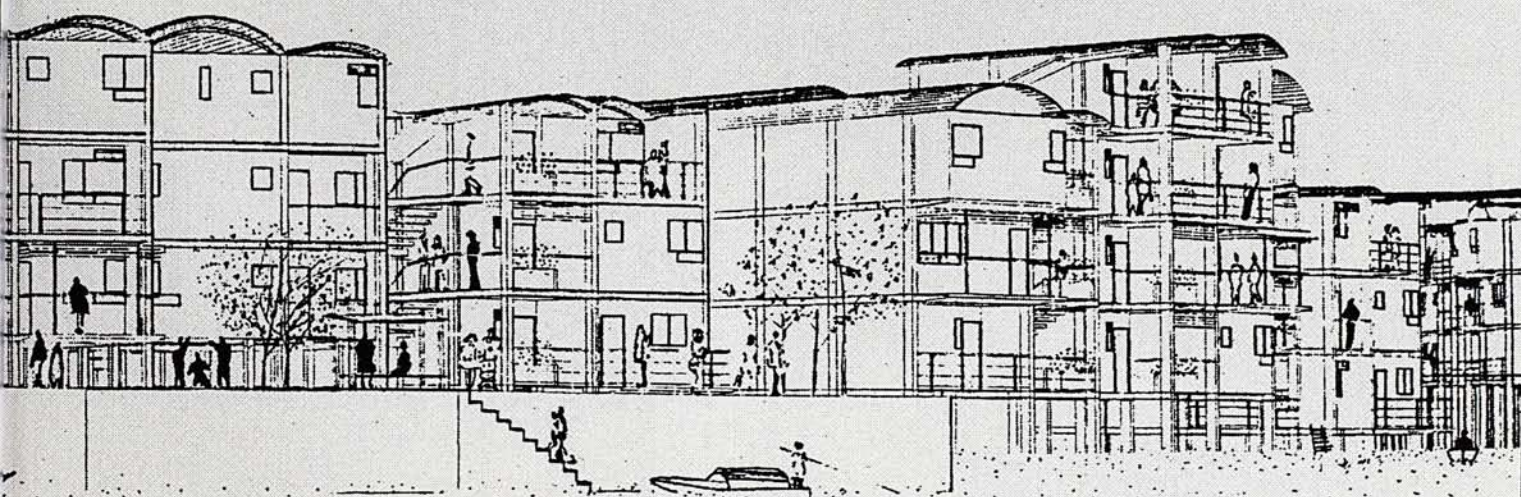
Section AA



Section BB

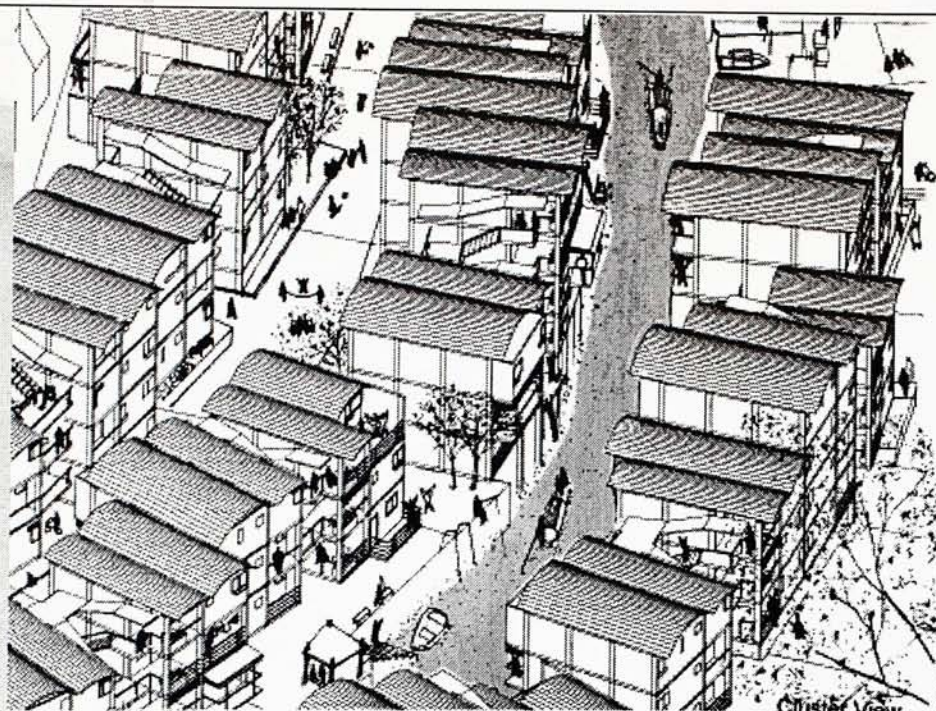
#### 4.4.1 Cluster

The dwelling units are shifted forward or backward to create the irregular order of the layout and the varied negative spaces for the varied communal space of the cluster.



Cluster Elevation





Cluster View

Cluster View



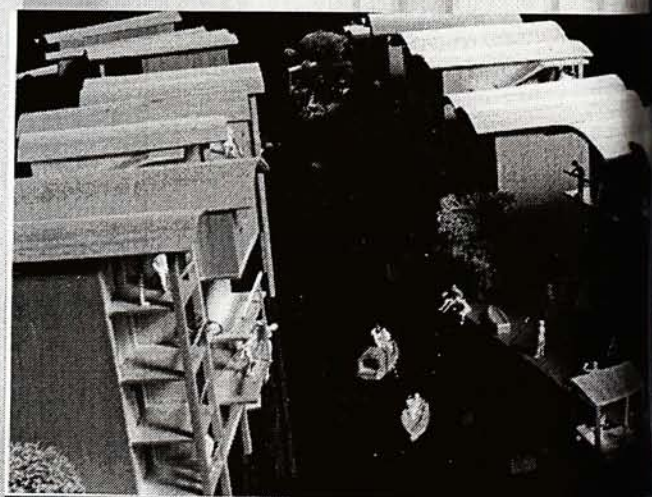
View of Canal

View of Canal



View from Balcony

View from one Dwelling unit's Balcony







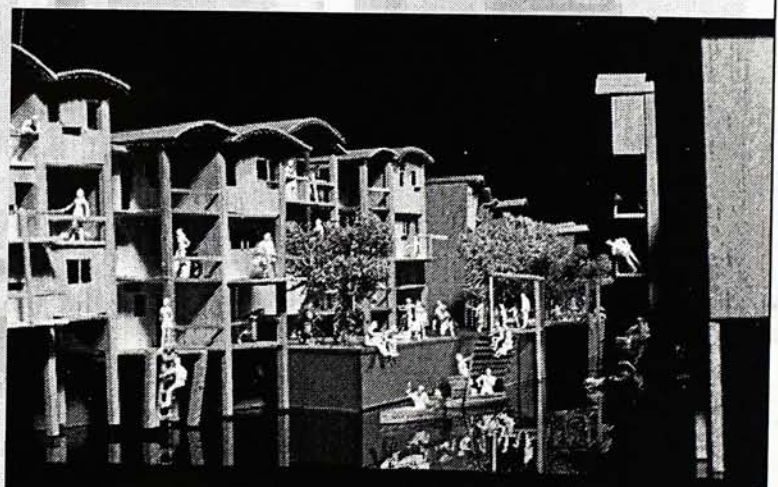
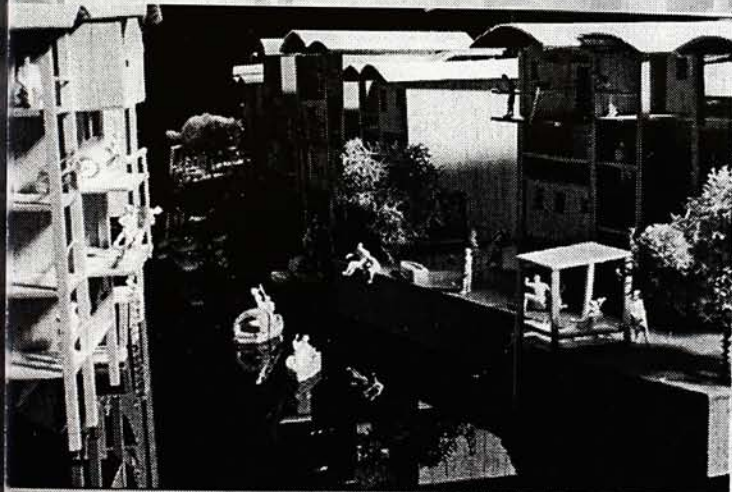
Street Level

View from Street Level

#### **4.4.2 Activities in the Cluster**

For the housing project, most of them are passive projects or so-called 'software' projects. Indeed, it is extremely important for the users how to use the space of 'hardware' which the designers forecast.

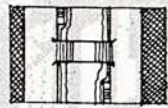
In this case, the flexibility and the dispersed spaces are very important to help to create the interesting interactions from the experience of village settlement pattern and the spaces how to be used.



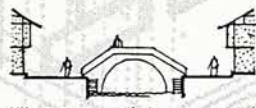
Cluster Model



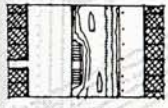
# Settlement interaction among canal, streets, bridges, corridors, piers & huts in the southern Changjiang



兩街夾一河



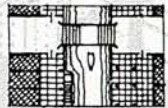
住宅—街—公用碼頭—河—公用碼頭—街—住宅



一街一河夾一河



住宅—街—公用碼頭—河—步行道—住宅

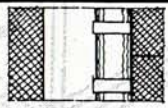


兩條步行道夾一河



住宅—步行道—碼頭—河—碼頭—步行道—住宅

## Private Space



一街與一水渠平行



住宅—街—私用碼頭—水渠—住宅



一街與河平行



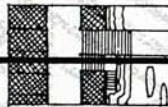
住宅—街—公用碼頭—河—公用碼頭—街—住宅



建築夾河兩岸



住宅—私用碼頭—河—私用碼頭—住宅

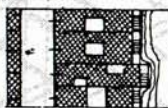


河與街平行佈置

河與街平行，中間建築作橋形佈置。

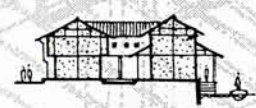


住宅—街—商店—橋—河



建築與河、街垂直佈置

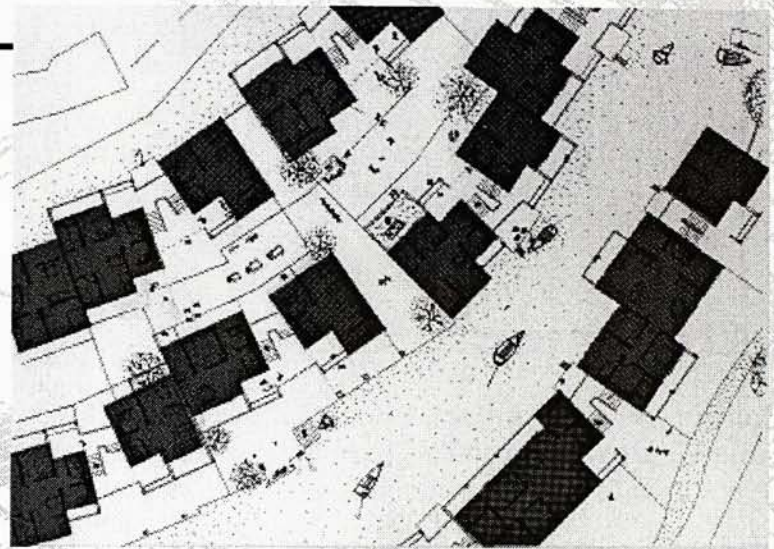
每戶建築垂直於河街，多處有水上出入口。



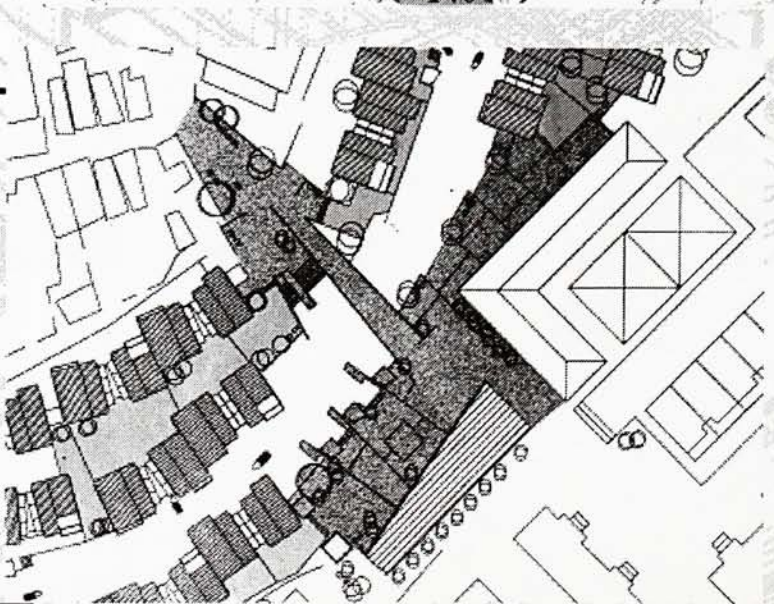
住宅—天井—住宅—私用碼頭—商店

• 平面圖

• 立剖面圖



## Transition of Open Space

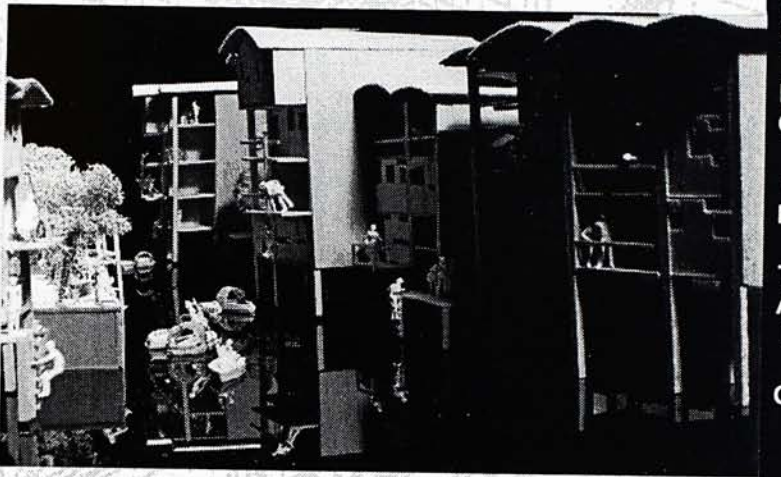




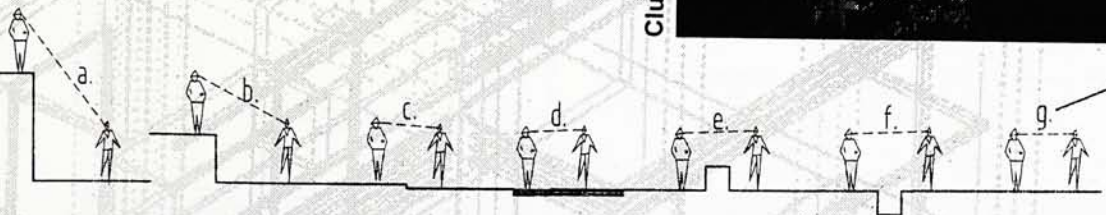
#### 4.4.3 Cluster level

Following the traditional organization of Tai O stilt homes, the **communal and working spaces** are located **in front of the entrances**, which are produced by the positive space -- the huts' random setting.

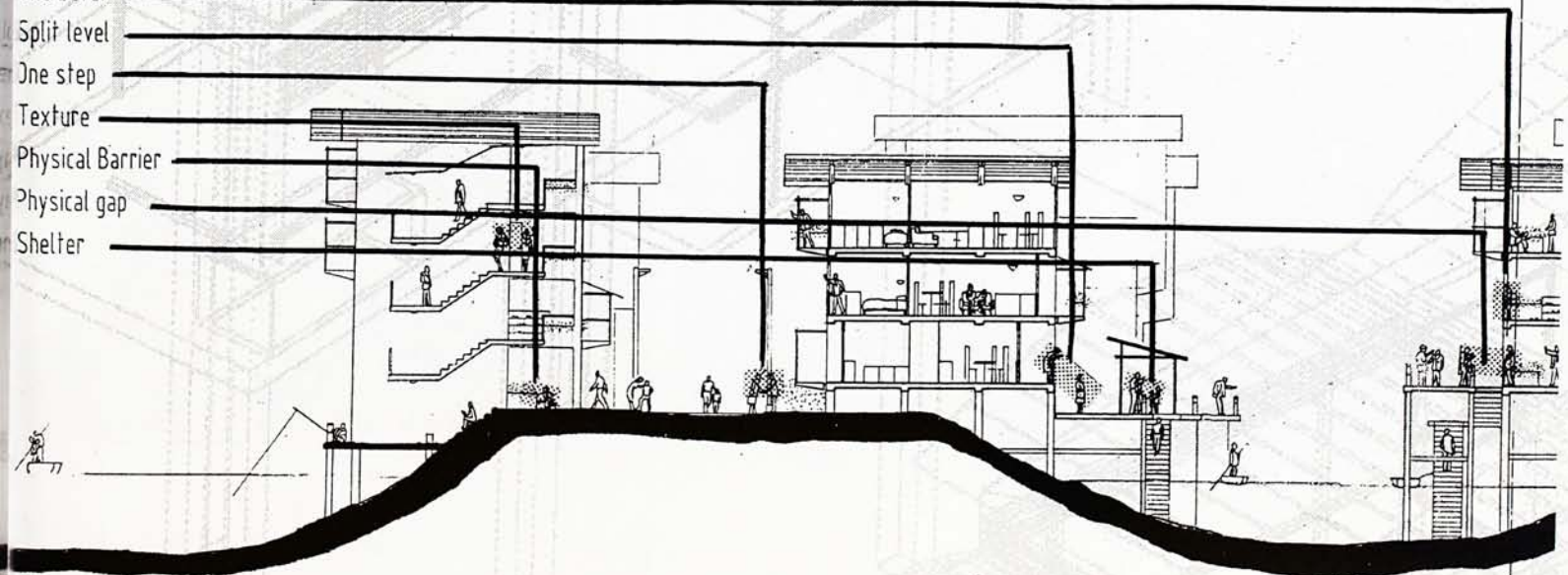
Such semi-public spaces are created as the working and communicated positions and also they provided the **passive space** for the residents to gather and chat. In such case, **interaction of behaviour** happened and the action and reaction occurred...



Cluster Model Showing the Use of Semi-public Space



- One Level
- Split level
- One step
- Texture
- Physical Barrier
- Physical gap
- Shelter

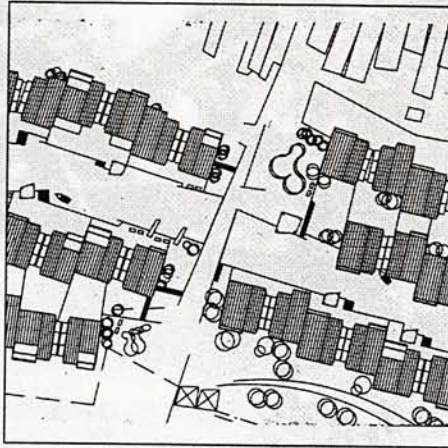


Space Defined





Existing Path for the Bus Stop and surrounding



Proposed Linkage & Open Space

## 4.5 Open Space Level

### Open Space as Communal Space

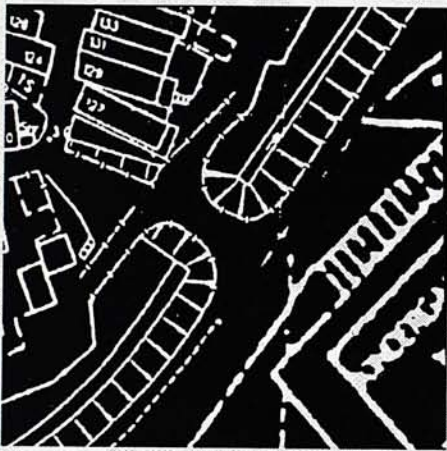
Following the existing circulation of the old village, there are three main routes to link the surrounding. In such situation, the routes are improved as three paths and main communal spaces for the residents as it lacks of the open spaces in the community.

### 3 Communal Space

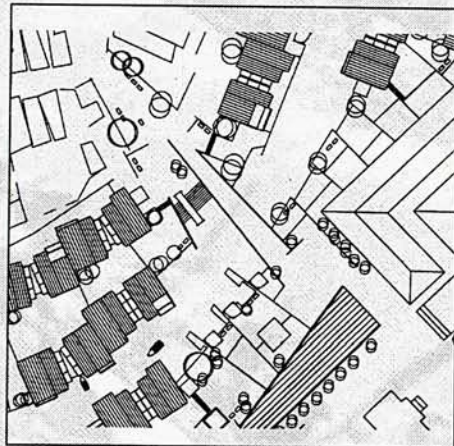
One is the main circulation & linkage between the **bus terminal and the village**.

One is the main gathering place for the residents in the past. There will be one **community centre and the main pier** for the new development.

Another one is the linkage among the **carpark**, resettlement area and the village.



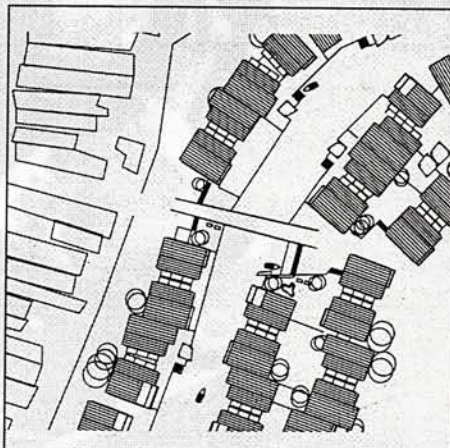
Existing Gathering Place



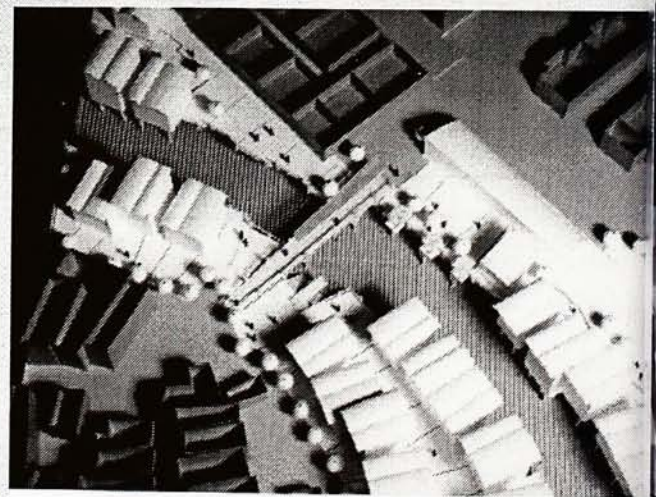
Proposed Communal Space and Community Center



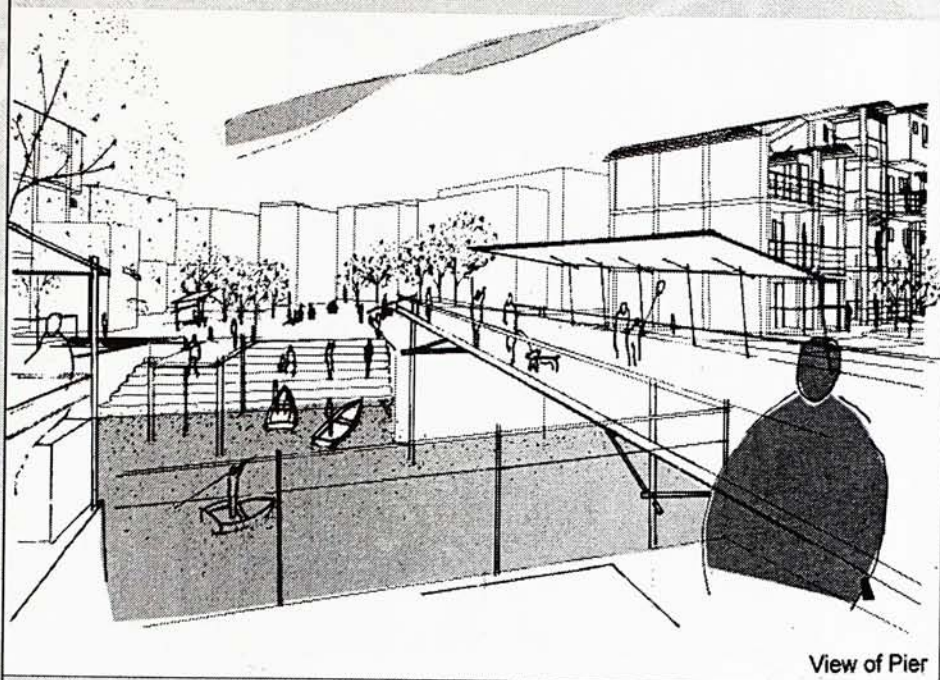
Existing Path to Temporary Carpark



Proposed Linkage for the village and Carpark





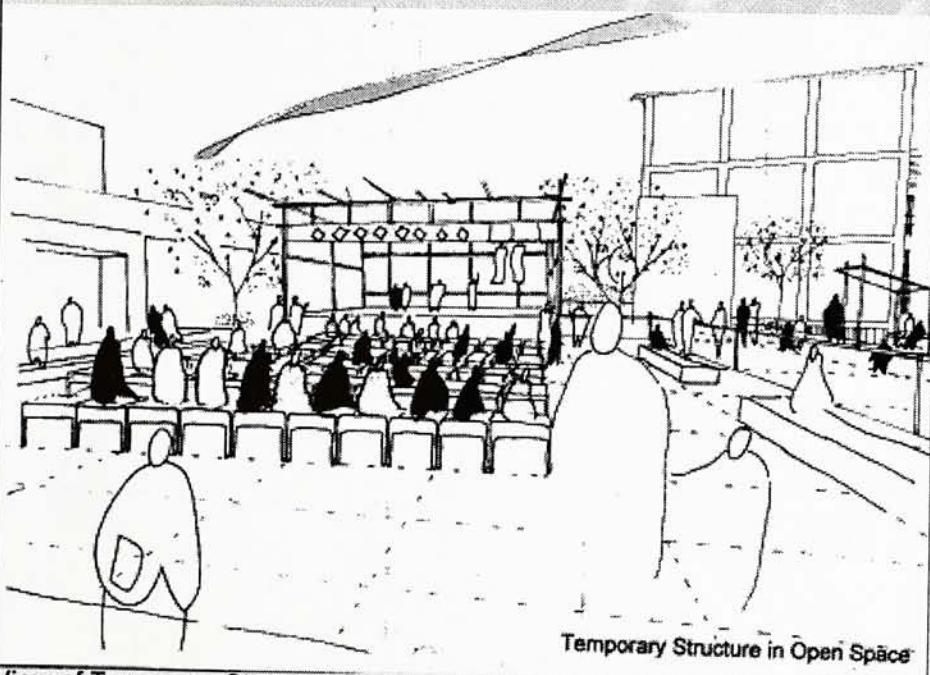


View of Pier

View of Temporary Market & Pier

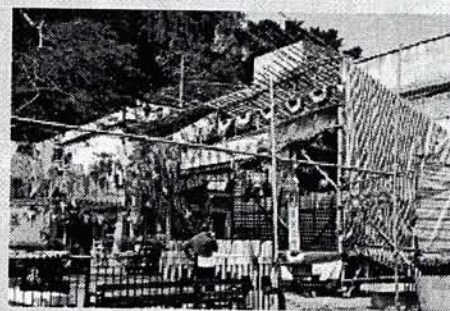


Temporary seafood market set up to fulfil the existing flexible situation in the multi-functional pier.

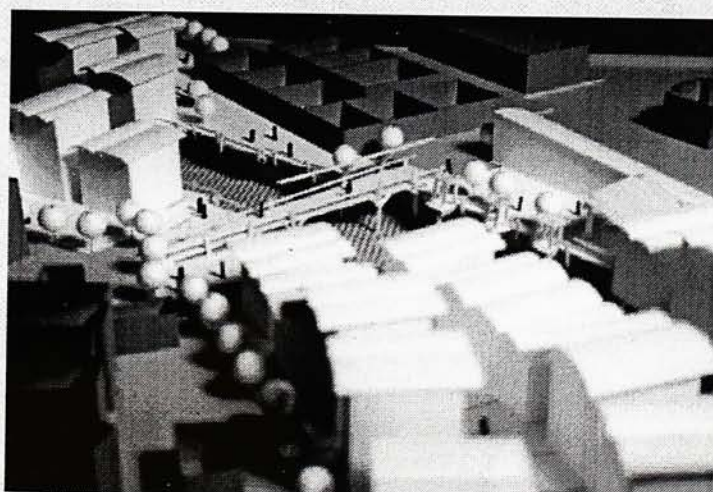
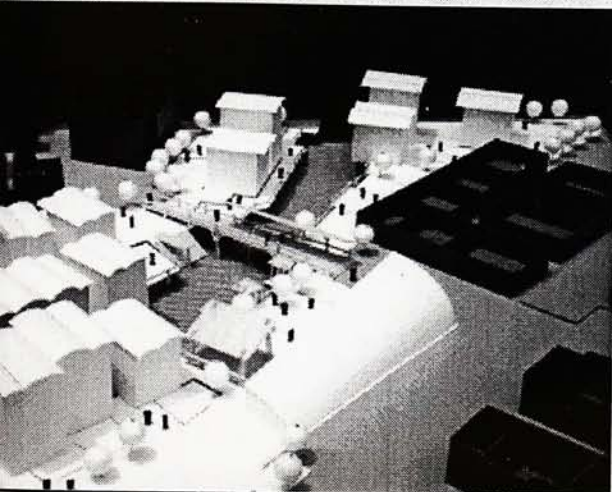


Temporary Structure in Open Space

View of Temporary Structure for Festivals

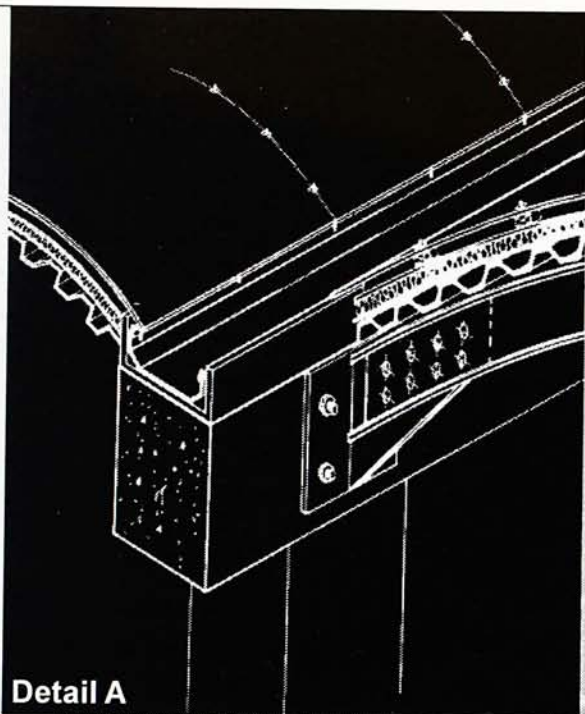


Temporary structure set up to increase the flexibility of the communal space and to respond to the existing situation.

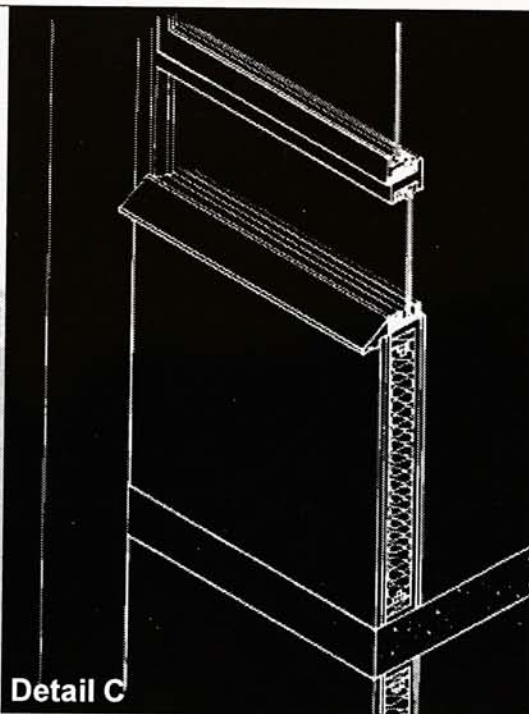


Communal Space Model for the community centre area

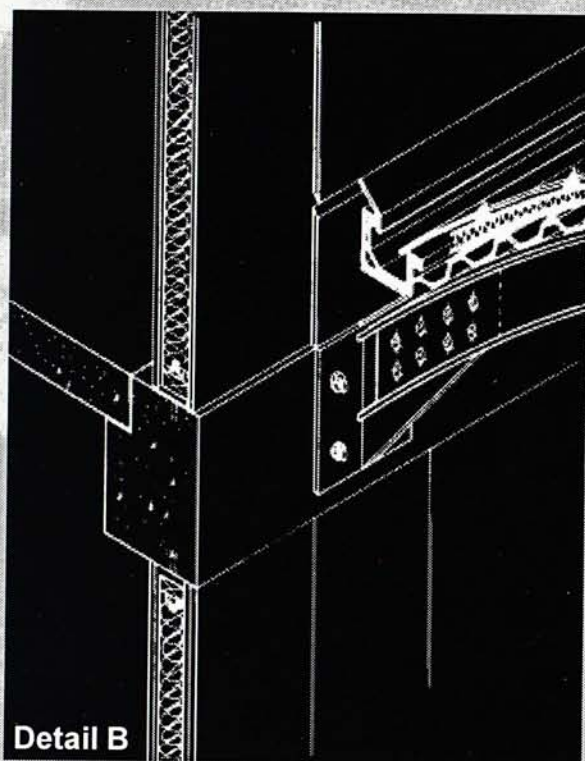




Detail A



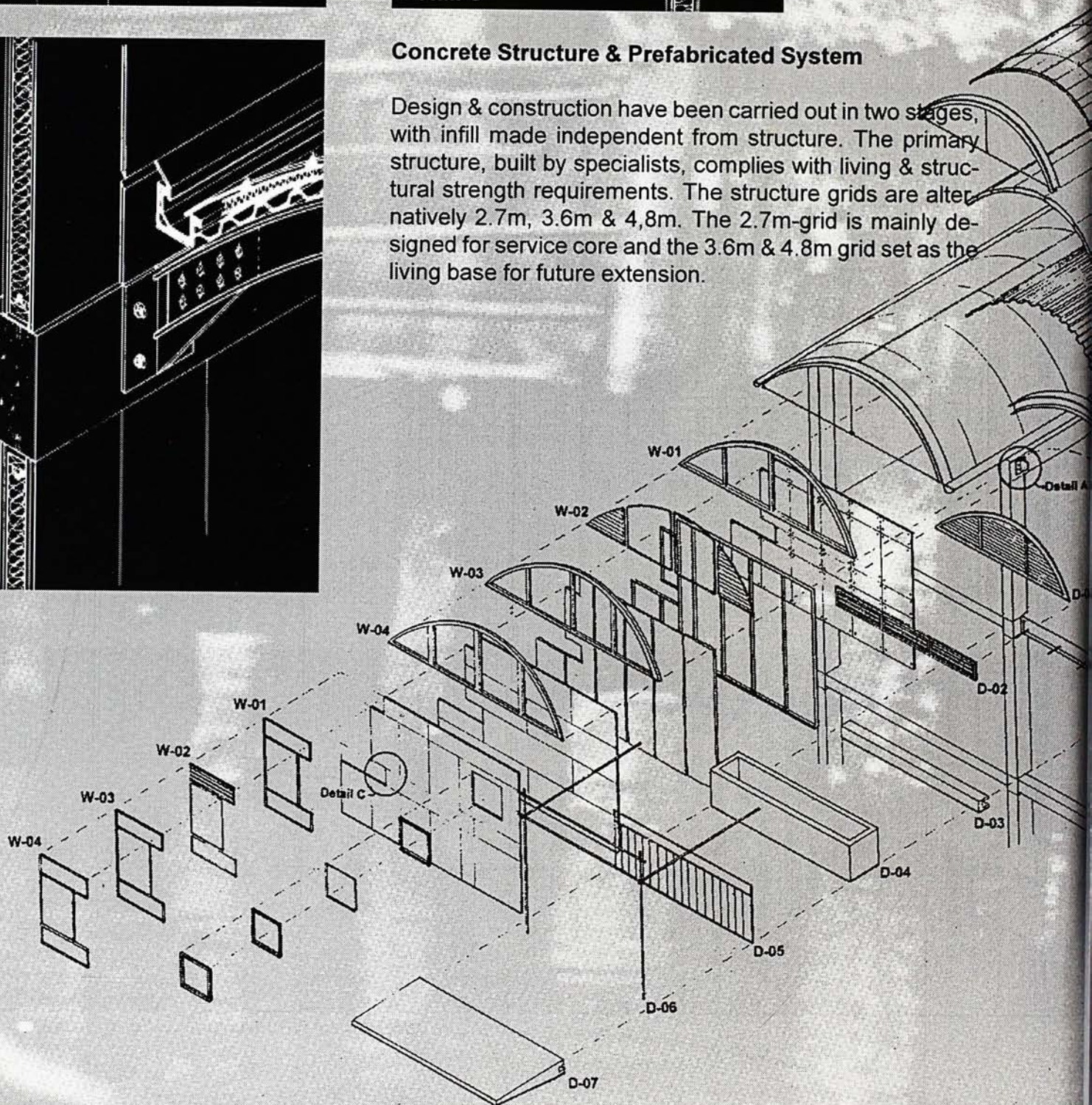
Detail C



Detail B

### Concrete Structure & Prefabricated System

Design & construction have been carried out in two stages, with infill made independent from structure. The primary structure, built by specialists, complies with living & structural strength requirements. The structure grids are alternately 2.7m, 3.6m & 4.8m. The 2.7m-grid is mainly designed for service core and the 3.6m & 4.8m grid set as the living base for future extension.



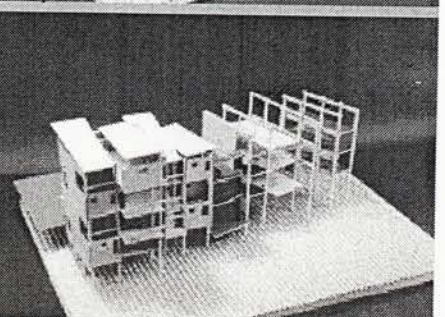
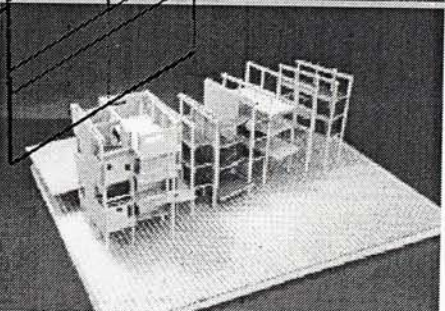
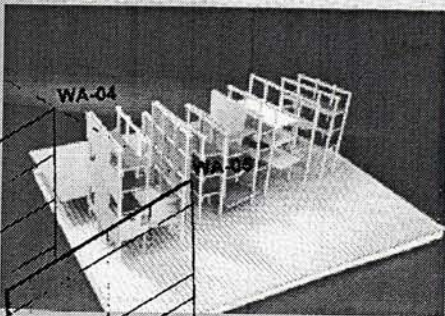
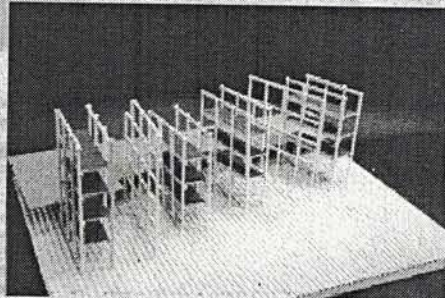


## 4.6 Details & Construction

### Building System -Exploded Isometric Scale 1:50

- |       |                             |
|-------|-----------------------------|
| S-01  | Concrete Structural Frame   |
| S-02  | Service Core                |
| R-01  | Metal Angles                |
| R-02  | Curved I-Beams              |
| R-03  | Galvinised Corrugated Metal |
| R-04  | Insulation                  |
| R-05  | Metal Decking               |
| R-06  | Edge Flashing               |
| WA-01 | Dry Wall                    |
| WA-02 | Plates & Studs              |
| WA-03 | Fiberglass Insulation       |
| WA-04 | Plastic Washer              |
| WA-05 | Metal Decking               |
| W-01  | Interior Windows Frame (AL) |
| W-02  | Float Glass                 |
| W-03  | Exterior Windows Frame (AL) |
| W-04  | Frame Places                |
| D-01  | Upper Ventilation Louvres   |
| D-02  | Lower Ventilation Louvres   |
| D-03  | Edge Cap                    |
| D-04  | Plant Box                   |
| D-05  | Handrail                    |
| D-06  | Trellis                     |
| D-07  | Balcony                     |

#### Construction Process



The secondary space can be equiped and transformed by the users according to their own family requiriements. The several types of prefabricated element are designed to fit the structural grids and to create the communal space by the infill system.

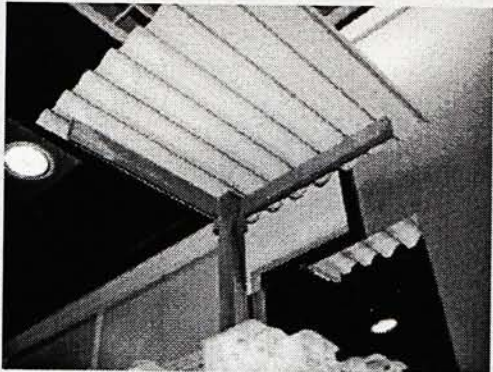


# **Special Studies: Material**

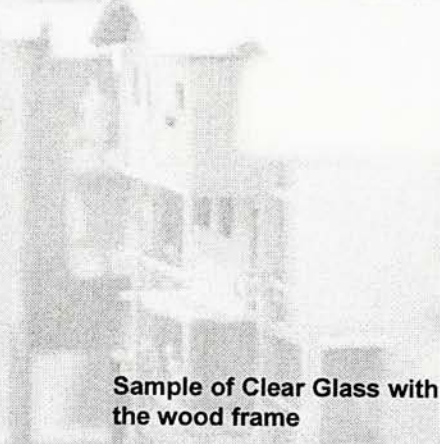
At the end of this term, there is a "special Studies" period to study the details and the material for the mixing.

In it, the materials are tested and show the quality as mixing them together. For the material stand, the samples of different material show in the same proportion with the full scale of the elevation of experimental housing.

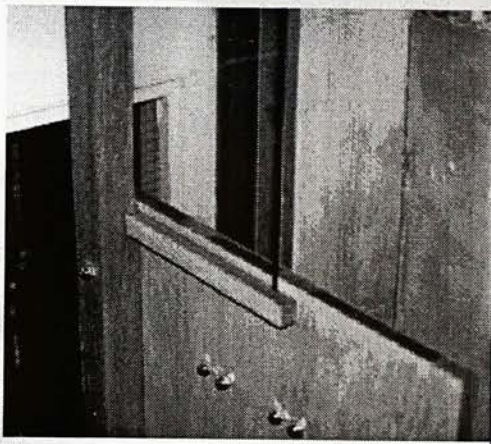
It is interesting to show the real material together and compared with the cluster model on it...



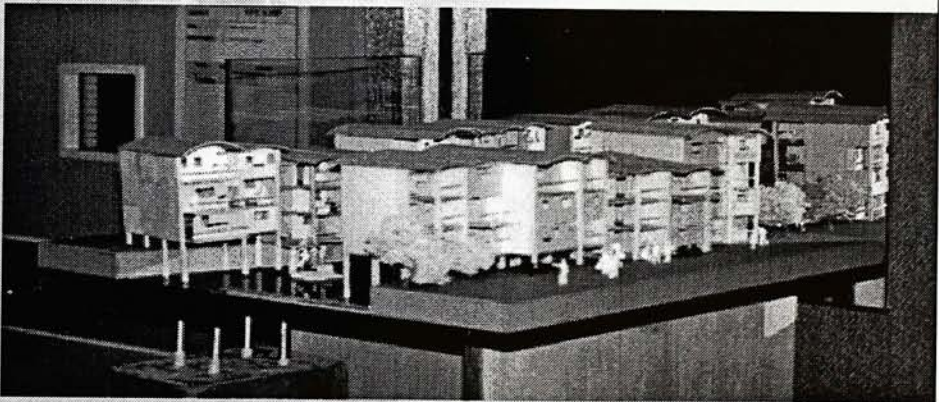
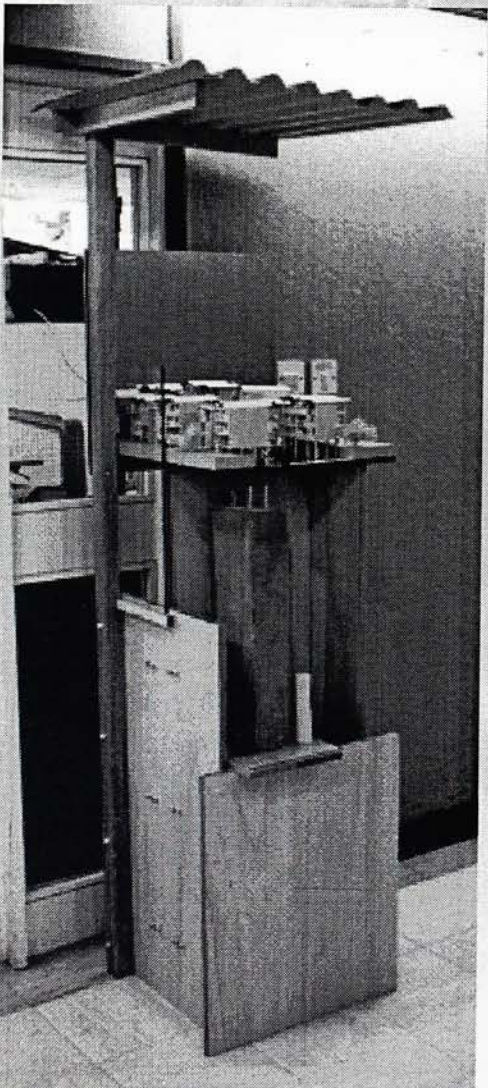
Galvinised Corrugated Metal  
(2 types for choice)



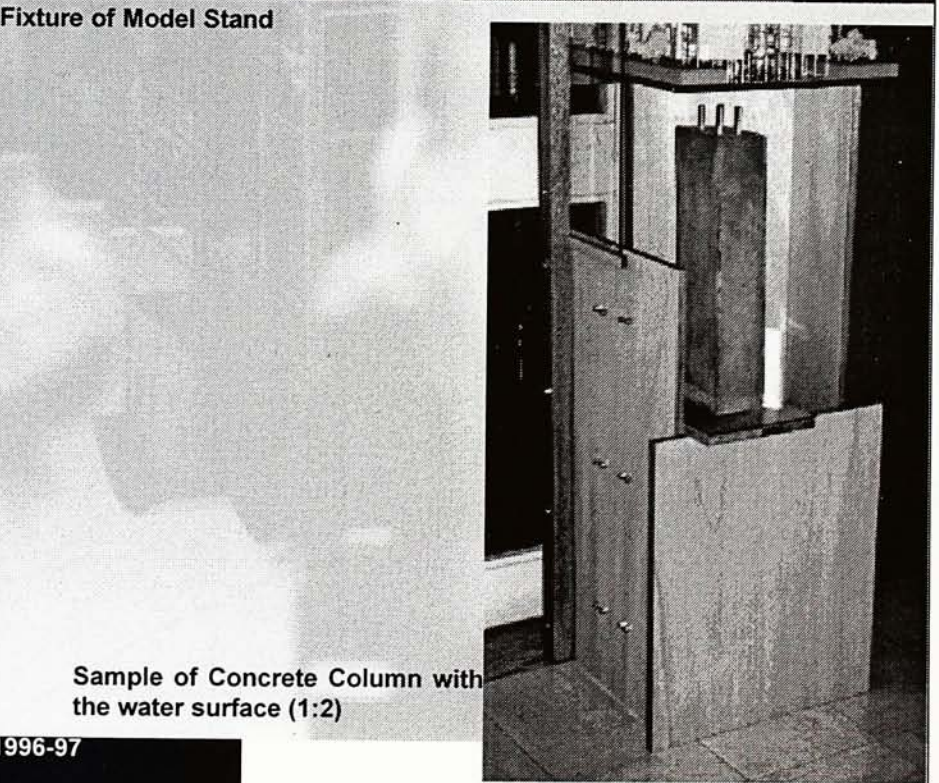
Sample of Clear Glass with  
the wood frame



Sample stand with the Cluster Model



Fixture of Model Stand



Sample of Concrete Column with  
the water surface (1:2)



## Appendix

Programming report

Schedule of Work

Bibliography

---



Life inTai O



# Content

## **Chapter 1 Introduction**

- 1.1 Background**
- 1.2 Challenge**
- 1.3 Point of Departure**

## **Chapter 2 Clients and Users Profile**

- 2.1 Clients Profile**
- 2.2 Views**
- 2.3 Finances**
- 2.4 Demography of Users**
  - 2.4.1 Population in Tai O
  - 2.4.2 Population Distribution
- 2.5 A Profile of Village Life**

## **Chapter 3 Site Study**

- 3.1 Background**
  - 3.1.1 Location
  - 3.1.2 History
- 3.2 Pattern Analysis**
  - 3.2.1 Topological Pattern
  - 3.2.2 Circulation Pattern
  - 3.2.3 Career Pattern
  - 3.2.4 Stilt Homes ("Peng Houses")
- 3.3 Physical Conditions**
  - 3.3.1 Climate
  - 3.3.2 Geotechnics of the site
  - 3.3.3 Suggestions for Layout and Nature of Built-form
- 3.4 Lung Tin Estate**
  - 3.4.1 Lung Tin Estate, Phase I
  - 3.4.2 Lung Tin estate, Phase II



### **3.5 Constraints**

3.5.1 Owner of Land / Existing Property

3.5.2 Zoning Conditions

3.5.3 Lease, Height & Shadow Restrictions

3.5.4 Foundation & Drainage

3.5.5 Main Services

### **3.6 Housing Problems and Opportunities**

3.6.1 Problems from the past experiences

3.6.2 A New Outlook: Changes in Housing Policy

## **Chapter 4 Project Programme**

### **4.1 Mission**

4.1.1 User mission

4.1.2 Architect mission

### **4.2 Goals**

### **4.3 Special Issues**

### **4.4 Schedule of Accommodation**

### **4.5 Bubble Diagram of Spatial Relationship**

### **4.6 Design Strategies**

## **APPENDIX**

### **I. Population in Tai O (1981 & 1991, Census)**

### **II. Precedent Studies**

- Masterplan, Ayr, Scotland
- Aranya -- Planning and Design of Low-cost Housing Project at Indore, India
- "documenta urbana", Kassel

### **III. Neighbourhood Town**

## **Bibliography**



## Chapter 1 Introduction



**1.1 Background**

**1.2 Challenge**

**1.3 Point of Departure**



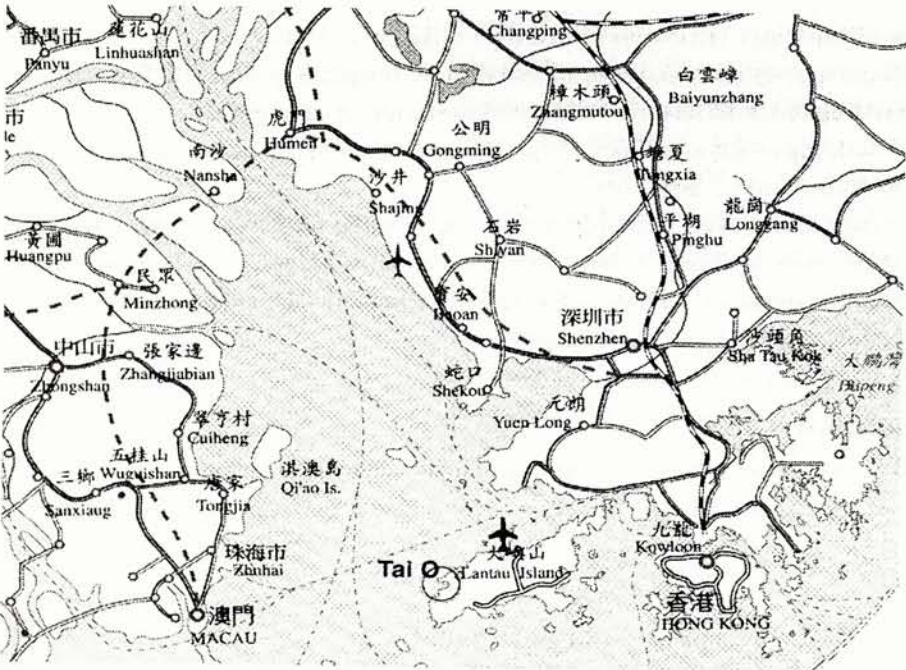
1.1 Background

Tai O is one of the most famous historic fishing villages in Hong Kong. There we can find a unique community and good relationship of neighbourhood. However, Tai O faces the dilapidation and the decline in fishing industry like other old village in Hong Kong. The temporary structure-- traditional stilt homes ("Peng Houses") caused the health and fire problem potentially. In this case, Community Development Committee of the Hong Kong Housing Society would like to improve this place for resettlement of the resident of "Peng Houses". The goals of resettlement are to solve the above problem and also to create a new system for the users to sustain with the spirit of the existing community and the sense of the belonging.

1.2 Challenge

At this time, several events happen:

- i. In 1998, Tung Chung New Town develops to support the new airport. (no. of population: 33,000 in 2002 to 210,000 in 2011).
- ii. In est. 2001, typhoon shelter built as the maintenance & supporting service in Southern Lantau Island for the fishing boats & yachts from the mainland. And also it potentially



serves the fishing career for **Pearl Delta** and attracts the fishing career to sustain in Tai O.

iii. Tourist facilities are provided in Tai O to promote this unique village for the tourists.

*\*\*Tai O locates on the month of Pearl river.*

Due to the existing problems and unique communality of Tai O, the new development causes the conflict and the new challenge...



### 1.3 Point of Departure

How are we going to organize such a vast building volume into a well-balanced pattern of interrelated community units, better fitted for the democratic way of life than our present chaotic cities are?

The sickness of our present communities is the pitiful result of our failure to put basic human needs above economical and industrial requirements.

In this case, Community Development Committee (CDC.) of the Hong Kong Housing Society is formed to reconstruct the communality of Tai O by a sequence of experimental housing in this resettlement project. CDC. wanted by this project to rebuild their communal relationship in such historic fishing village background and provided a better living environment rather than the crowded urban city to resettle for health development.

The Committee proposed a low density rural housing between the traditional village and the new development zone which as a **new layer** for the existing village and a seed for future development in such historic village of Southern China.



## **Chapter 2 Clients and Users Profile**

### **2.1 Clients Profile**

### **2.2 Views**

### **2.3 Finances**

### **2.4 Demography of Users**

#### **2.4.1 Population in Tai O**

#### **2.4.2 Population Distribution**

### **2.5 A Profile of Village Life**



## 2.1 Clients Profile

### Name:

Community Development Committee of the Hong Kong Housing Society

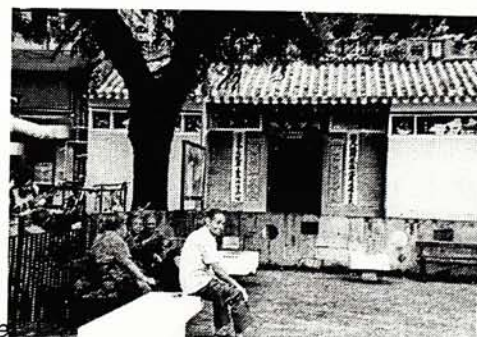
### Form:

The Community Development Committee (CDC.) of the Hong Kong Housing Society is established for the resettlement and the development of traditional historic village or existing community in Hong Kong by the government. It tends **to co-operate the residents to rebuild their community by the application of several innovative planning system.**

In it, for the communal resettlement of Tai O – the unique community, CDC. is involved. It proposed the study of the resettlement method for existing community and village in Hong Kong.

Including the Committee Chairman from Hong Kong Housing Society, the committee comprises 10 non-official committee members, come from the Hong Kong Housing Society, Social Welfare Department, voluntary organization and the existing residents in Tai O for 5 fields -- houses, public space, services, streets and green areas. This kinds of the different party coordinate to set up a new system for adequate the existing community.

Also, there is a consultant team formed by administrators, industrialists, financiers, Realtors, contractors, engineers and architects for developing a prefabrication system for future communal housing.



*Communal Space in front of the Kwan Temple*



## 2.2 Views

The CDC. of Hong Kong Housing Society is for helping the existing resident of the slums or villages to resettle their own community and to keep their communal spirit which is **not just for the quantity (basic need) but the quality.**

Due to development of Tung Chung New Town, proposed project of the shelter, health problem and the insufficient communal facilities in Tai O, the committee emphasized the **reconstruction of communality** in it. They tend to build a low density housing system for rebuilding such **community and neighbourhood relationship** which is lost in the urban fabric. The site is located between the traditional village and the new development area as a new layer for the existing village to provide for the resettlement of the temporary waterfront structure in Tai O towards a sustainable community.



*One pier in Tai O*

## 2.3 Finances:

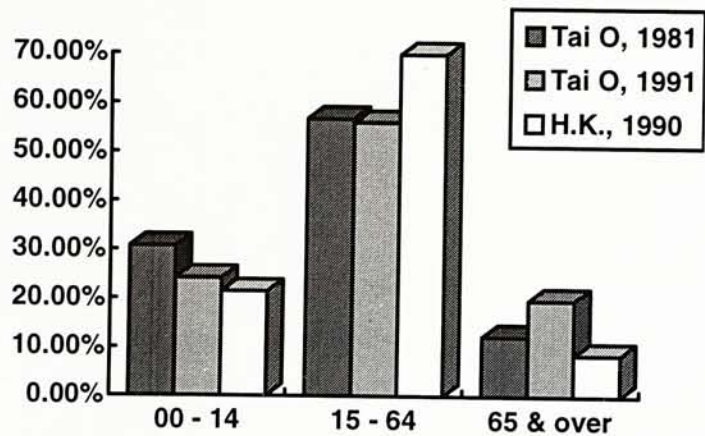
The CDC. of Housing Society is financially autonomous body responsible for managing its own finances. Under the financial arrangements between the Government and the Foundation, the Government is committed to subsidizing the CDC's community programme with the provision of free land for rental housing and sites for flats for sale at concessionary prices. It was also financed by the private section, including banks, foundations and the existing community.

The major sources of income are revenues from the sale of community ownership and rents collected from the rental flats. It has been able to meet not only the recurrent expense but also capital expenditure. The money will be ploughed back in the massive community programme to ensure that the tenants would be the ultimate beneficiaries.



2.4 Demography of Users

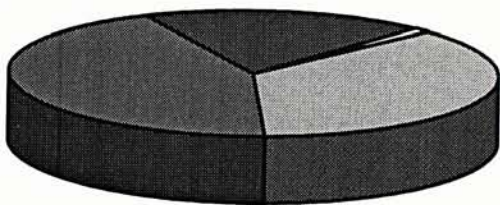
2.4.1 Population in Tai O (1981 & 1991, Census)



2.4.2 Population Distribution: (1993, Islands District Development programme)

- #Government Building: include the water works depot, fire station, public toilets, sewage pumping station, police station & post office.
- #Institutional Building: include two kindergartens, three primary schools & one secondary school.
- #Community Building: include a community centre, library, clinic and **elderly home (Ming Oi 40 places).**

■ Temp. Housing Area (1308)	■ Village House (1562)	■ Rural Public Housing (661)	□ Institutional Quarters (33)
-----------------------------	------------------------	------------------------------	-------------------------------



From 1981 to 1991, 2344 persons decreased in Tai O. In 1981, the dependence ratio was high, but the elderly ratio was lower than that in 1991. However, in 1981 & 1991, the dependence ratio was also high compared with the whole Hong Kong’

There are 1358 resident for resettlement from about 370 families. Most of them are elderly or even senior citizen. Some of the young generation are still counted as they have their account but moved out from their home. In this case, the main users for the resettlement is the elderly as the young generation moved out in the past 10 years. However, the young generation and nuclear family are also potential to come back as the resettlement project improves the living quality in Tai O; and also the chance of career is improved by the service support for the Chinese boats and Tung Chung New Town. Neighbourhood Community Centre and Recreation Centre are provided for the community.







## **Chapter 3 Site Study**

### **3.1 Background**

#### **3.1.1 Location**

#### **3.1.2 History**

### **3.2 Pattern Analysis**

#### **3.2.1 Topological Pattern**

#### **3.2.2 Circulation Pattern**

#### **3.2.3 Career Pattern**

#### **3.2.4 Stilt Homes ("Peng Houses")**

### **3.3 Physical Conditions**

#### **3.3.1 Climate**

#### **3.3.2 Geotechnics of the site**

#### **3.3.3 Suggestions for Layout and Nature of Built-form**

### **3.4 Lung Tin Estate**

#### **3.4.1 Lung Tin Estate, Phase I**

#### **3.4.2 Lung Tin estate, Phase II**

### **3.5 Constraints**

#### **3.5.1 Owner of Land / Existing Property**

#### **3.5.2 Zoning Conditions**

#### **3.5.3 Lease, Height & Shadow Restrictions**

#### **3.5.4 Foundation & Drainage**

#### **3.5.5 Main Services**

### **3.6 Housing Problems and Opportunities**

#### **3.6.1 Problems from the past experiences**

#### **3.6.2 A New Outlook: Changes in Housing Policy**



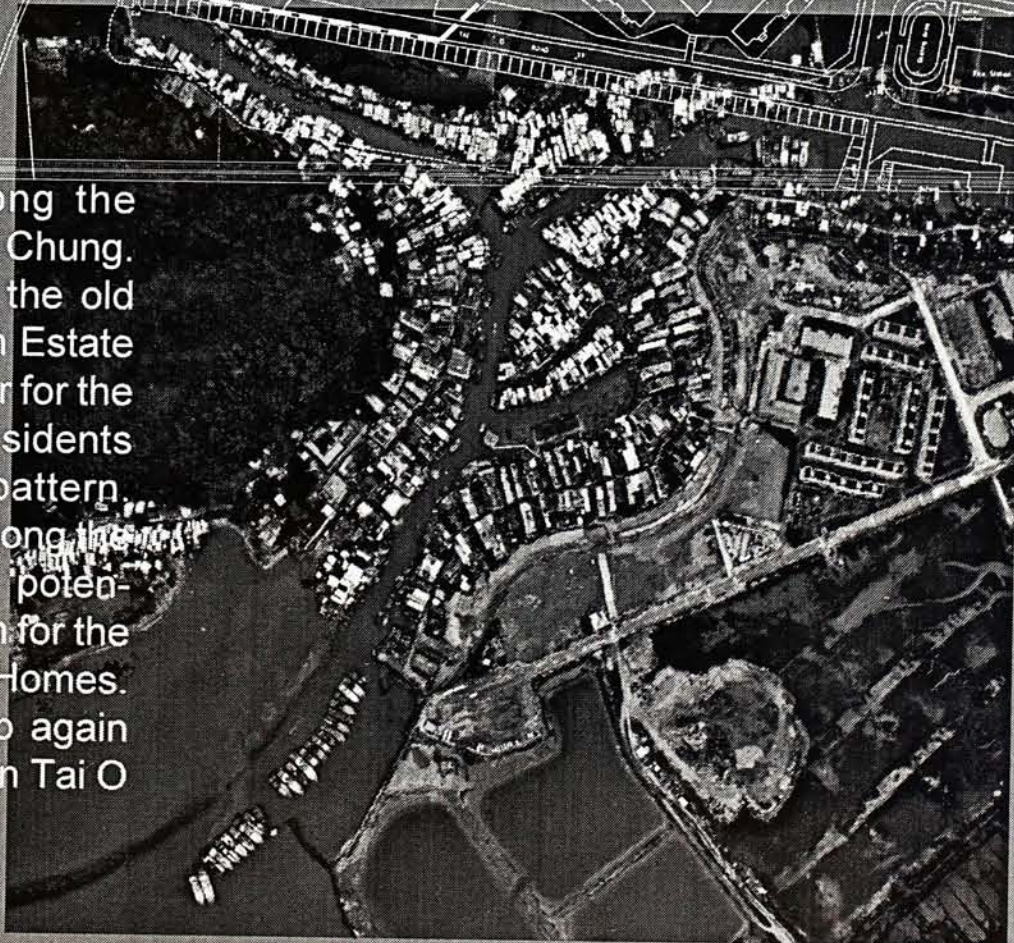
## 3.1 Background

### 3.1.1 Location



Tai O is sited on the southern Lantau Island. It faces the mouth of Pearl River and near the new airport. It has potentially developed a point for tourism in Hong Kong and also the government planned to build a typhoon shelter for the Chinese fishing boats for the services supporting. At the past hundreds years, it is the important source of salt producing and fishing market. One of the oldest fishing villages is located there. It has its own unique community and the relationship of neighbourhood.

Residents tend to gather along the stream and Stilt Homes in Tai O Chung. The site is selected inbetween the old village in Tai O and the Lung Tin Estate Phase I. There will be a new layer for the settlement of Tai O existing residents along the historic settlement pattern. There is a sewage duct located along the edge of the old village. It have potentially been developed as a stream for the existing residents from the Stilt Homes. It creates the closed relationship again between the life of the residents in Tai O and the waterfront...





### 3.1.2 History -- Sequence of the settlement

**North Sung-era (960-1127):** Salt pans in Tai O is first found for the salt producing.

**1650:** Kat Hing Back Street first appeared. Tai O become a trade & supply point for fishing boats and trading ships besides the salt producing.

**1750:** Wing On Street & Tai Ping Street appeared as the population increased and settle together.

**1850:** 3 rows of stilted Peng Houses appeared.

**1930:** Kat Hing Street, Market Street and more Peng Houses appeared.

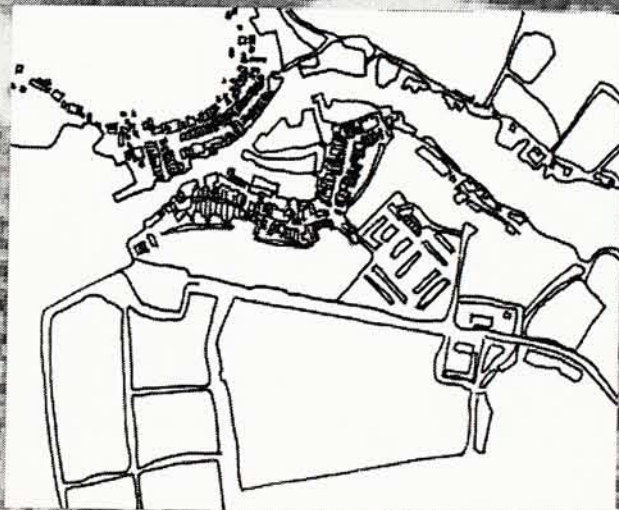
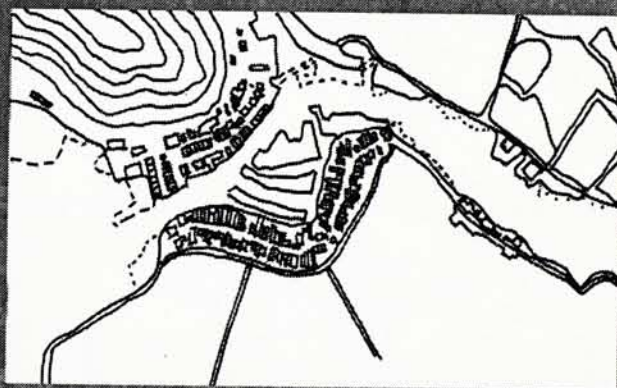
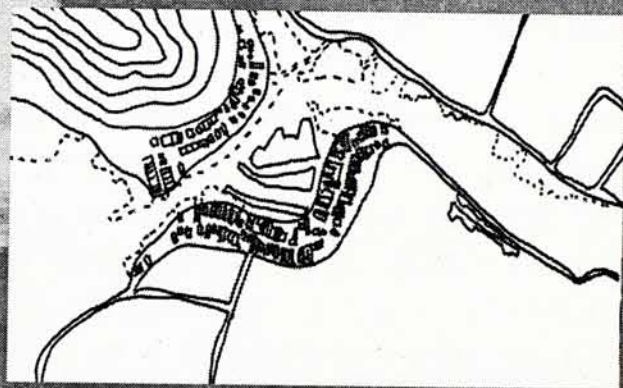
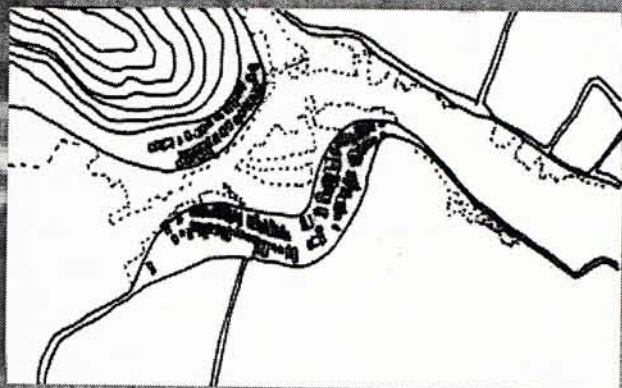
**1940:** During the World War II, salt producing and fishing became inter-dependent. Salt producing was necessary as salt was one of the major military needs. Also, fishes caught were more than enough, the fishermen would salt the fishes for future use.

**1965:** Tai O declined in its importance as urban development. Fishing and salt producing disappeared gradually. The fishermen had to go farther away for several days and settled their family members along the shore. The typhoon shelter off Shek Tsai Po & Tai Chung were

**1980:** Lung Tin Estate Phase I is built to resettle the Peng Houses residents in Yau Chung and Yim Tin Creek.

**1990s:** Lung Tin Estate Phase II is built to resettle the remained Peng Houses residents. However, the public housing stands empty till now. The Housing Authority plans to change them as HOS.

**2000:** SAR builds in 1997. Tung Chung New Town forms in 1998 for supporting the new airport. The shelter is built in 2001 to support the fishing career in Pearl Delta.





## 3.2 Pattern Analysis

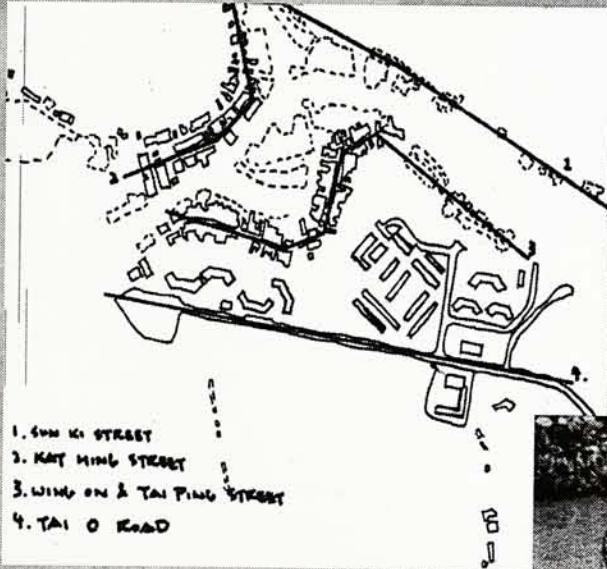
### 3.2.1 Topological Pattern



*Topology*

Actually, the whole development of Tai O is very much influenced by the topological pattern. The major organizing element is the stream. In the old time, the major activities are carried through the stream: transportation, trading, domestic activities and cultural activities. As a result, residents gather along the stream and settlement in Tai O Chung result (see Figure and Ground). Besides, most residents settle around the lower stream (Tai O Chung) but little around the upper stream because in the lower stream the water level is shallow enough that activities of the residents are easier to carry out. Another reason is that Tai O Chung is closer to the sea so as to facilitate their working sequence of transportation. Of course the settlements of salt producing and "tourist industry" are outside the "stream region" because the stream is not so important to them as to the fishermen.

*Settlement along the shore*



*Figure & Ground*



*Cultural activities in Tai O –  
Dragon Boat Competition*





### 3.2.2 CIRCULATION PATTERN



Main linkages between the site and the surrounding area

There are 2 means of circulation in Tai O: through water and through land. Sampans, bicycles and "foot" are main means for travelling in Tai O.

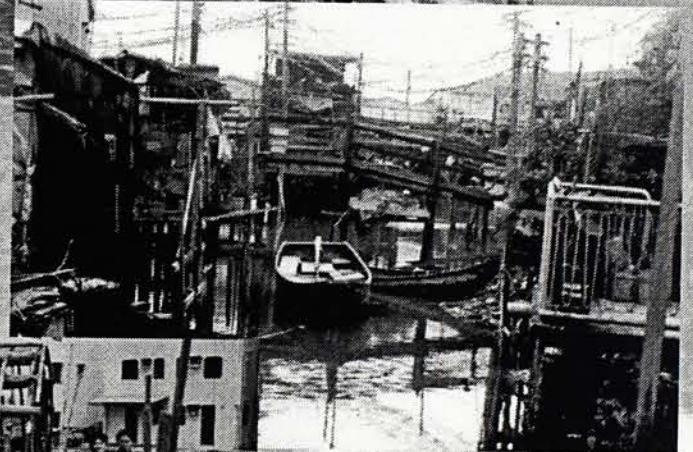
At first, sampan is the main circulation means for most fishermen living on "Peng Houses". On the other hand, 3 other circulation paths (narrow street) are important on land: Kat Hing Street for the northern shore; Wing On Street and Tai Ping Street for the southern shore; and the path through Shek Tsai Po to the ferry pier in the west of Tai O. A loop circulation is then completed by the connection of bridges. However, at the eastern end of Tai O Chung, a Wan Shui To (a little ferry for crossing the narrow water channel) is used in order to allow passing of sampans but since September, 1996, a concrete bridge is used instead of the "ferry".

Looking back to the area of Stilt Homes, the circulation pattern is quite interesting. Since the eastern ends of these little "islands" of "Peng Houses" are very close to one of the main street- Tai Ping Street, short bridges are located to circulate people between these two places. Some subsequent circulation routes are also built to distribute residents from the eastern ends of the islands to their respective stilt huts. These routes are actually the famous and characteristic pedestrian above the water".

Kat Hing Back Street  
(the narrowest street)



Wan Shui To  
(Hand-pulled ferry)



Bridge connecting the island  
and the shore



Typical pedestrian above water



### 3.2.3 CAREER PATTERN

Actually the settlement pattern in Tai O is very much influenced by the historical background of the change of career: from salt producing only; to salt producing and fishery; to fishery only; and to fishery and "tourist industry" at present. At the very beginning, the settlement is not concentrated in Tai O Chung, but dispersed with the salt pans. Later on because of the "career" convenience, fishermen started to settle around Tai O Chung. At present, shops for selling salted fishes, restaurants, sea-food stalls, and so on are crowded around the 4 main streets mentioned above. Therefore, it could be said that the career pattern is mainly consisting of the dispersed salt producing, the dense tourist-industry houses in the perimeter of Tai O Chung and the concentrated fishery in the centre.

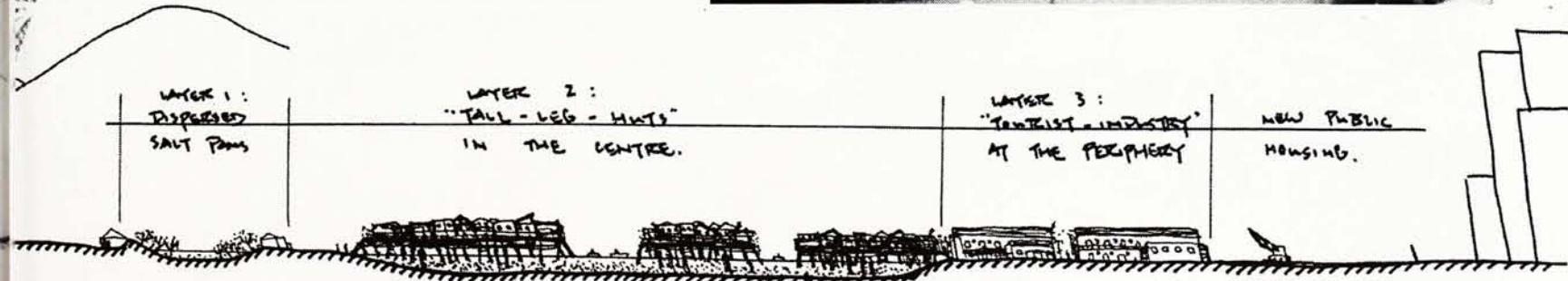
*Dispersed salt producing*



*Concentrated fishery*



*Dense tourist-industry*



*Cross Section through Tai O Showing 3 Layers of Career Pattern*



## 3.2.4 Stilt Homes

### Social Organization in Stilt Homes

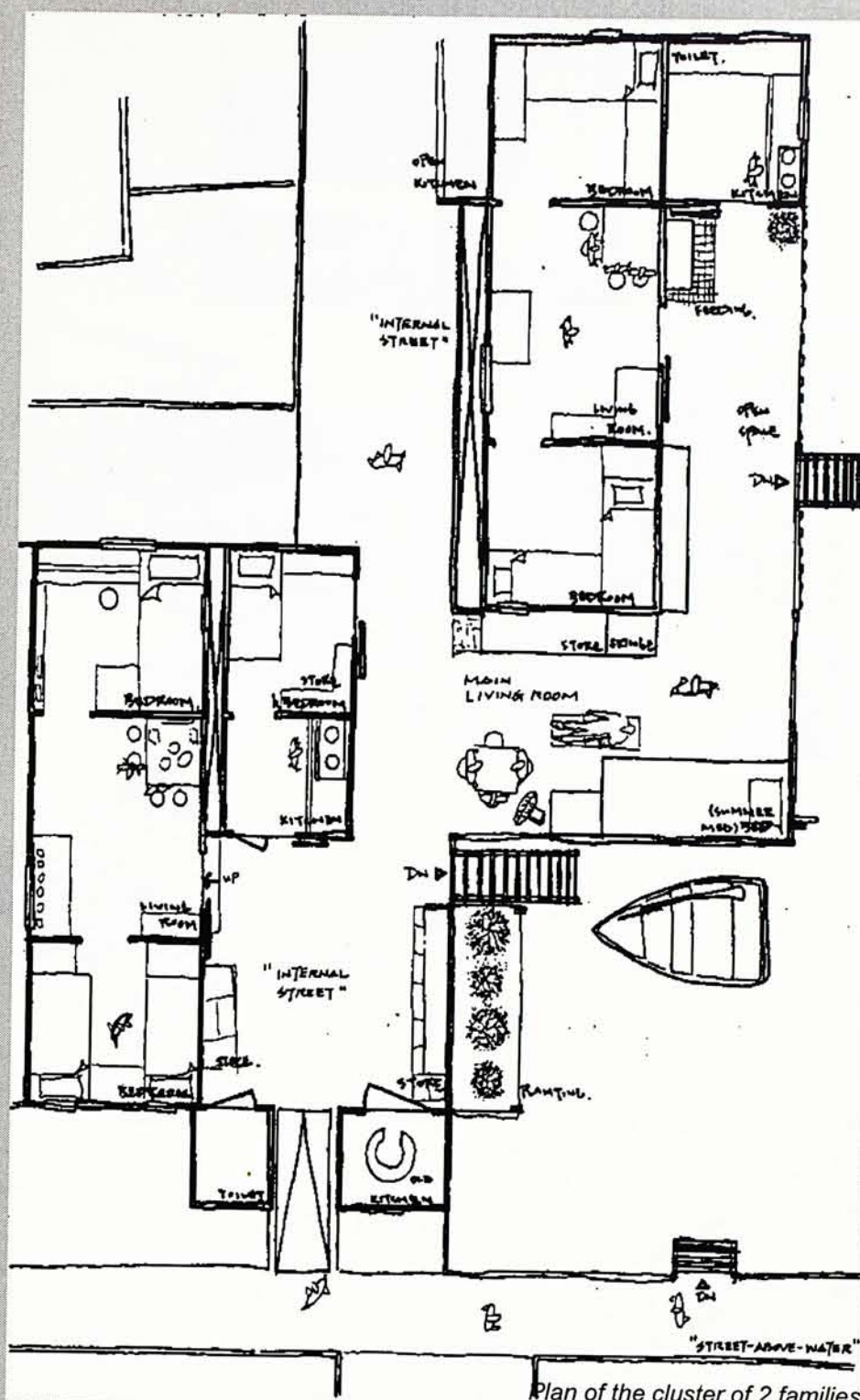
Apart from space for the career, social space is also a strong organizing element for these huts. As the typical example, it consists of two families: the bigger family with 7-8 members and the smaller one with 4-5 members. The organizing element between these two families is the main living room of the bigger family. Locating at the corner of the cluster, this living room serves both functions as circulation and social space. In terms of circulation, members of the smaller family have to by-pass this living room before getting back home. In terms of social space, this room, with big windows opening to the outside, acts as a semi-public space allowing members of the two families chatting with each other. Other functional spaces are then clustering around this social space to form the whole setting, like the concept of a traditional Chinese courtyard house. Last but not least, "internal streets" (semi-public) become a natural extension of the living room where certain social activities will take place such as housewives chatting with one another when making food or brushing clothes there.



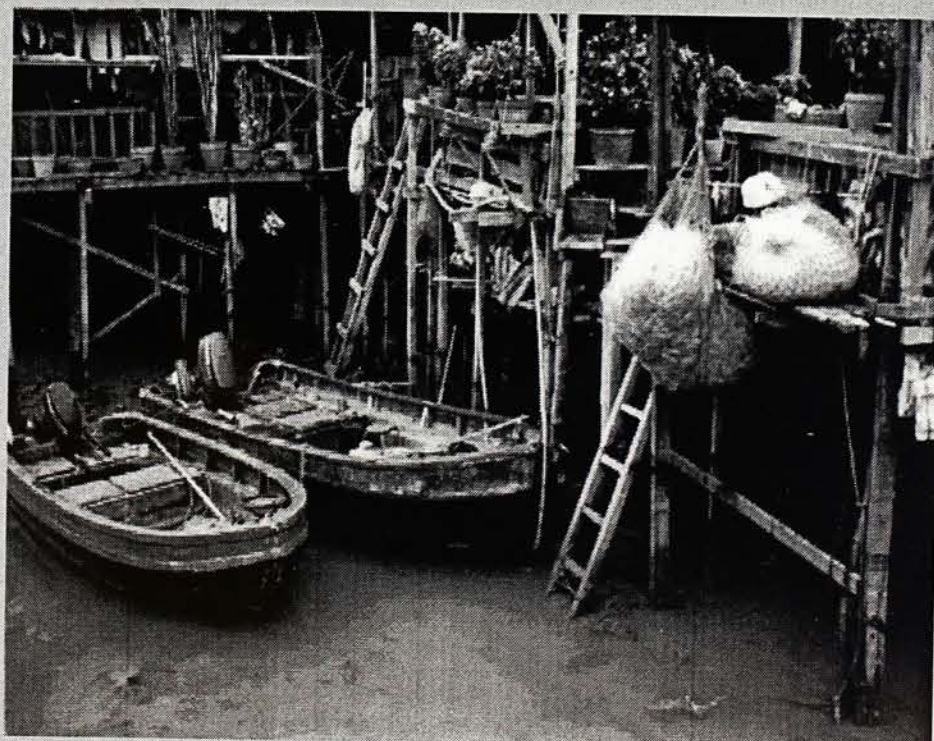
Organization of Stilt Homes

### Space for lifestyle

Though the fishermen are then living in huts rather than on fishing-boats after building a hut, they still continue fishery. Instead of sailing the big fishing-boats for fishing, they sail small sampans to do so. When they come back after fishing, they will tide their sampans under their huts, usually under the area of the living room (Also, sampans are their traditional transport). A ladder is usually located near the edge of the living room so that they can have easy access from the living room to the sampan and vice versa. Tools for fishing are also located there for fully utilizing the space and for career convenience.



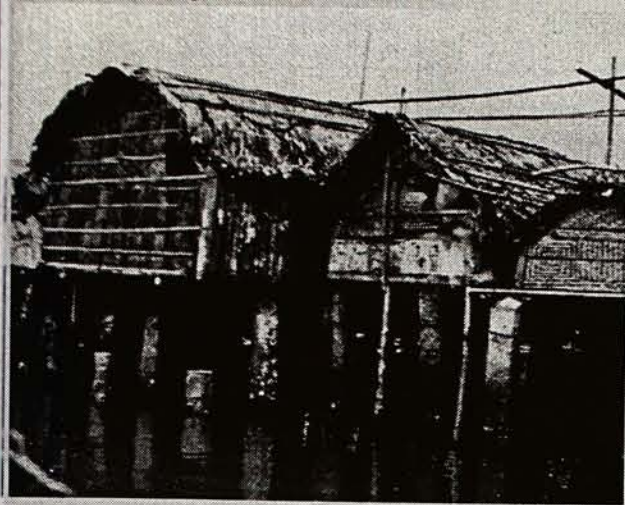
Plan of the cluster of 2 families



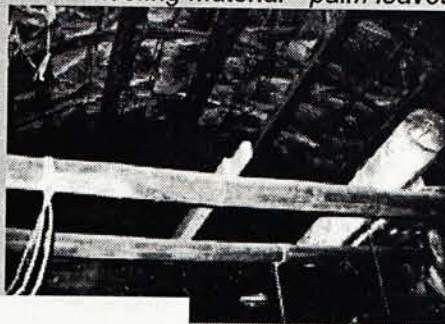
Space for lifestyle under the living room



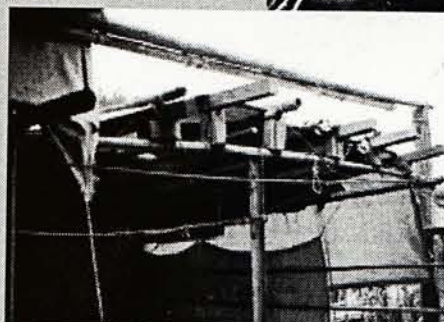
Primitive "Peng Houses"



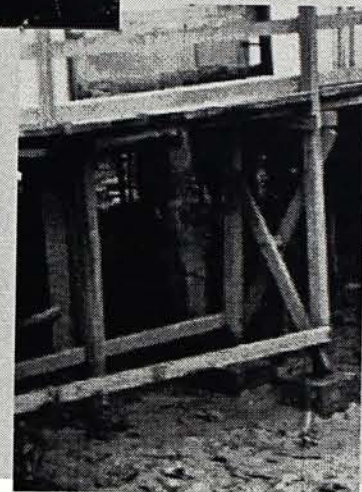
Roofing material- palm leaves



Foundation

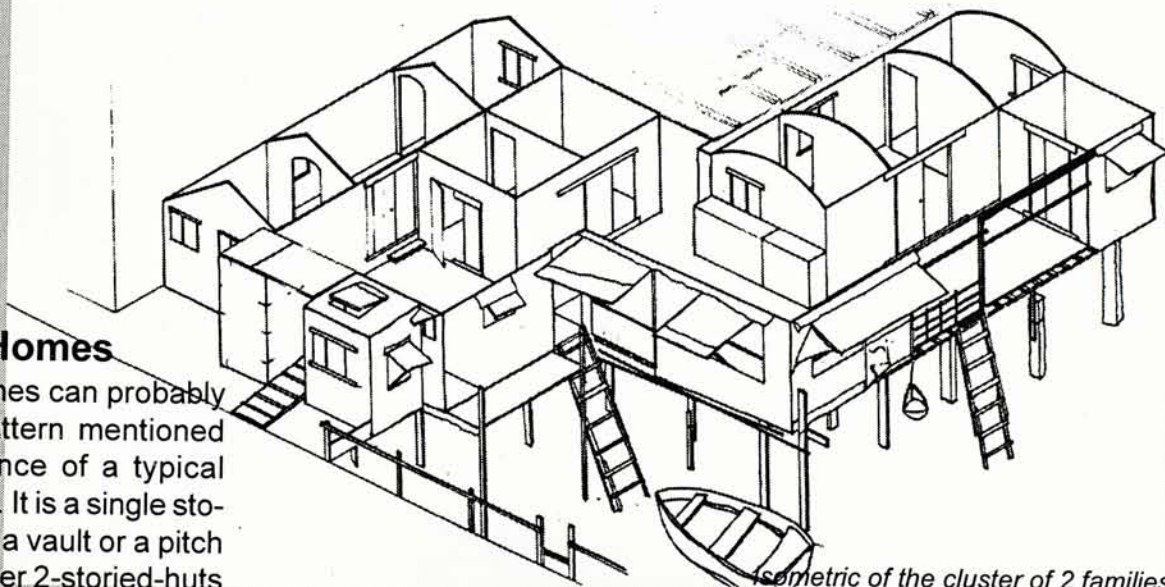
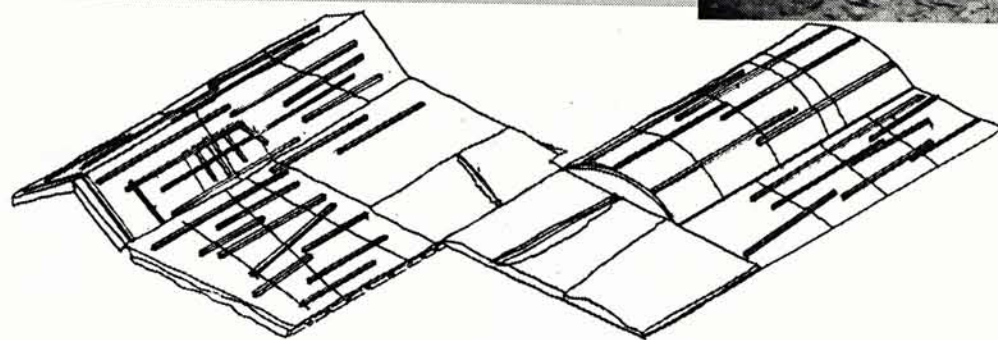


Construction of roof



## Formation of Stilt Homes

At the very beginning, fishermen in Tai O were living on their own fishing-boats. As time went by, some fishery became broken down, causing them to stay their family members to the shore near to Shek Tsai Po, tide those boats on supporting columns, and live in those "tided" fishing-boats on the shore permanently. Fishermen started to build squatter huts, standing on supporting columns above channels of water, around Tai O Chung and ultimately formed a settlement of characteristic Stilt Homes.



Isometric of the cluster of 2 families

## Construction of Stilt Homes

The study of a typical Stilt Homes can probably explain the related overall pattern mentioned above. The original appearance of a typical "Peng Houses" is very primitive. It is a single storey of living spaces, with either a vault or a pitch roof, sitting on tall legs. Any other 2-storied-huts (14 ft in height) commonly found today are modified from the former one. Since the huts are standing on water, the living space must be raised. To do so about 4 feet of a stone or wood column is inserted manually into the soil as the foundation, and the exposed rest becomes a supporting leg for the hut. For a stone leg, the top part of which will be carved into a small channel to allow a wood beam to sit on to support the floor. Additional columns, either wood or bamboo, will be used to support the roof. To form the roof, various sizes of wood blocks will be located on top of wood beams sitting on columns in such a way that either a vault roof or a pitch roof results. For the roofing, palm leaf is used as an isolating layer from rain and sun.



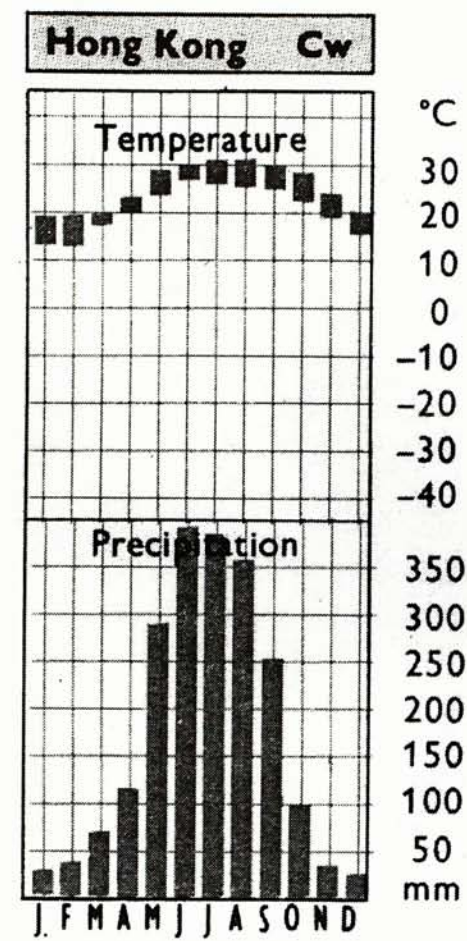
Present 2-storey height Stilt Homes



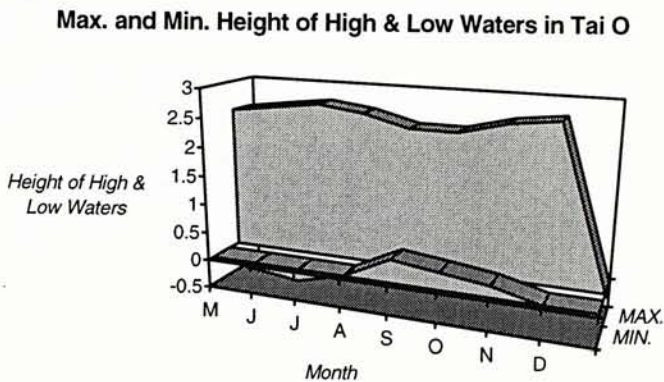
3.3 Physical Conditions

3.3.1 Climate:

Tai O – 22°15'N, 113°51'E



In Hong Kong, above mean sea level is 33m. However, with the exception of formed land in Tai O, the existing village is low lying at a level of only 3-4m above sea level. As a result, this area is subjected to flooding during severe typhoon and heavy rain



In such case, the maximum and minimum heights of high & low waters are very important for the living and fishery in Tai O.



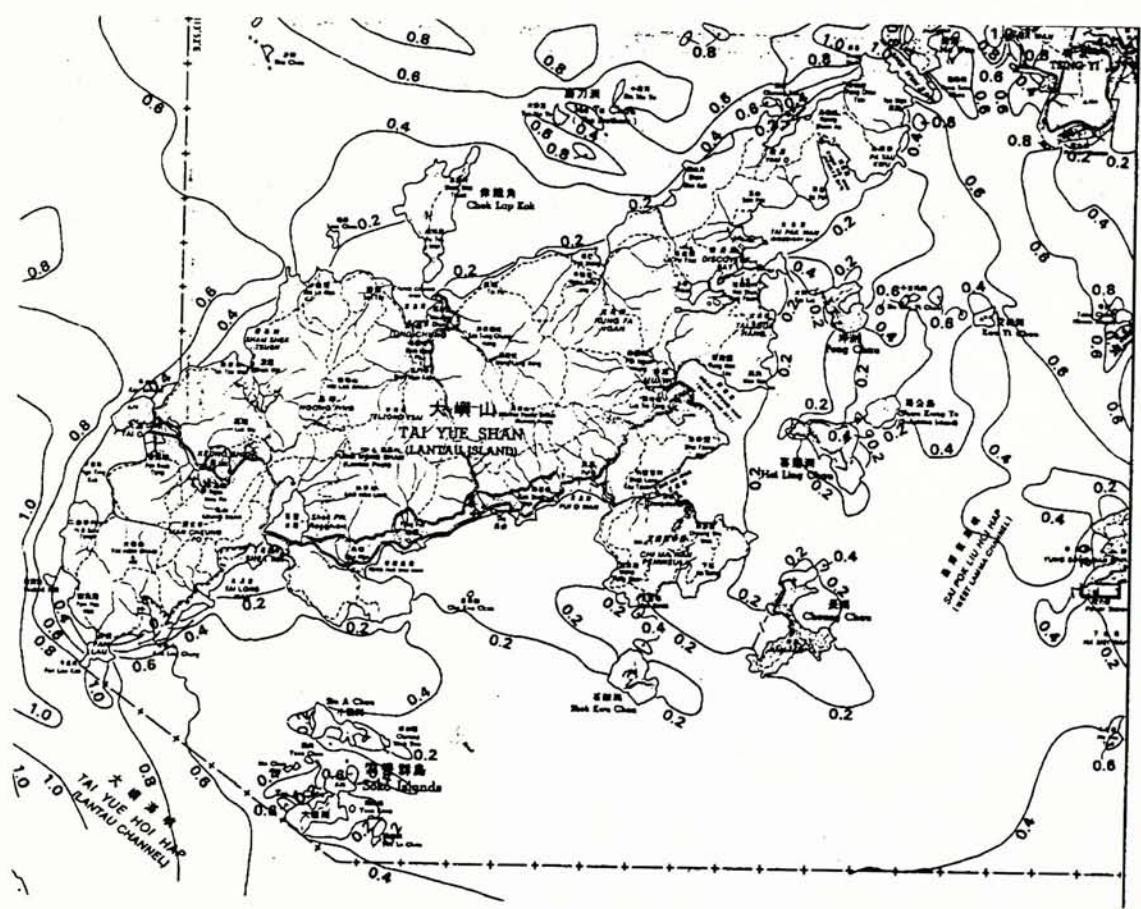
Low Tide



High Tide



For the microclimate in Tai O, at the Summer afternoon or night, **offshore wind** involves mainly for the comfortable conditions as **onshore wind** involves at day. Also, due to the relief of the spurs and valleys, the velocity of the wind reduced by the protection of the bay. However, the depth-averaged, maximum current velocities for dry season spring tide conditions in the Lantau Channel is slightly larger than that in West Lamma Channel.



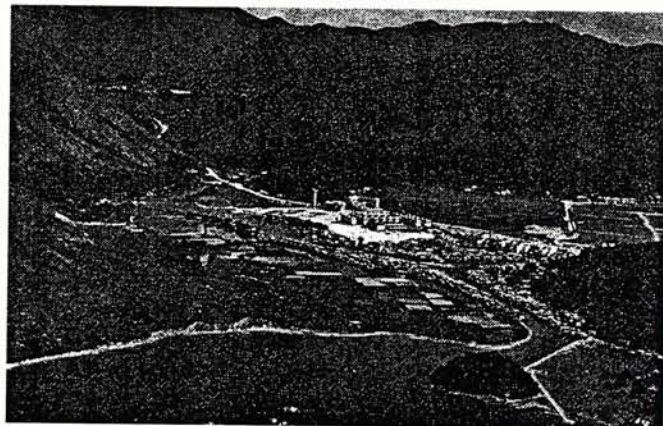
The Depth-Averaged, Max. Current Velocities for Dry Reason Tide Conditions



### 3.3.2 Geotechnics of the site:

The Lowland terrain of Tai O is covered by more than 20m of alluvium and marine deposits, possibly overlying 5 to 15m of completely and highly decomposed volcanic rock. Part of the development at Shek Tsai Po are built on reclaimed land. The alluvial flats and shallow bay possess potential for further reclamation.

Large settlements can be anticipated if loads are placed upon soft, compressible material. The colluvial slopes to the east and south of Tai O could provide large quantities of soft material. Smaller quantities could be won from the colluvial coastal slopes to the northeast. Landslips on the sideslopes have resulted in substantial colluvial footslopes. A large number of grave sites are scattered across the terrain. The stream channels are less distinct upon reaching the colluvial because stream flows often disappear underground through the more permeable bouldery colluvium. (*"Geotechnical Assessment for Planning Purposes, GASP Report XI: South Lantau"*, by Geotechnical Control Office, Civil Engineering Services Department)



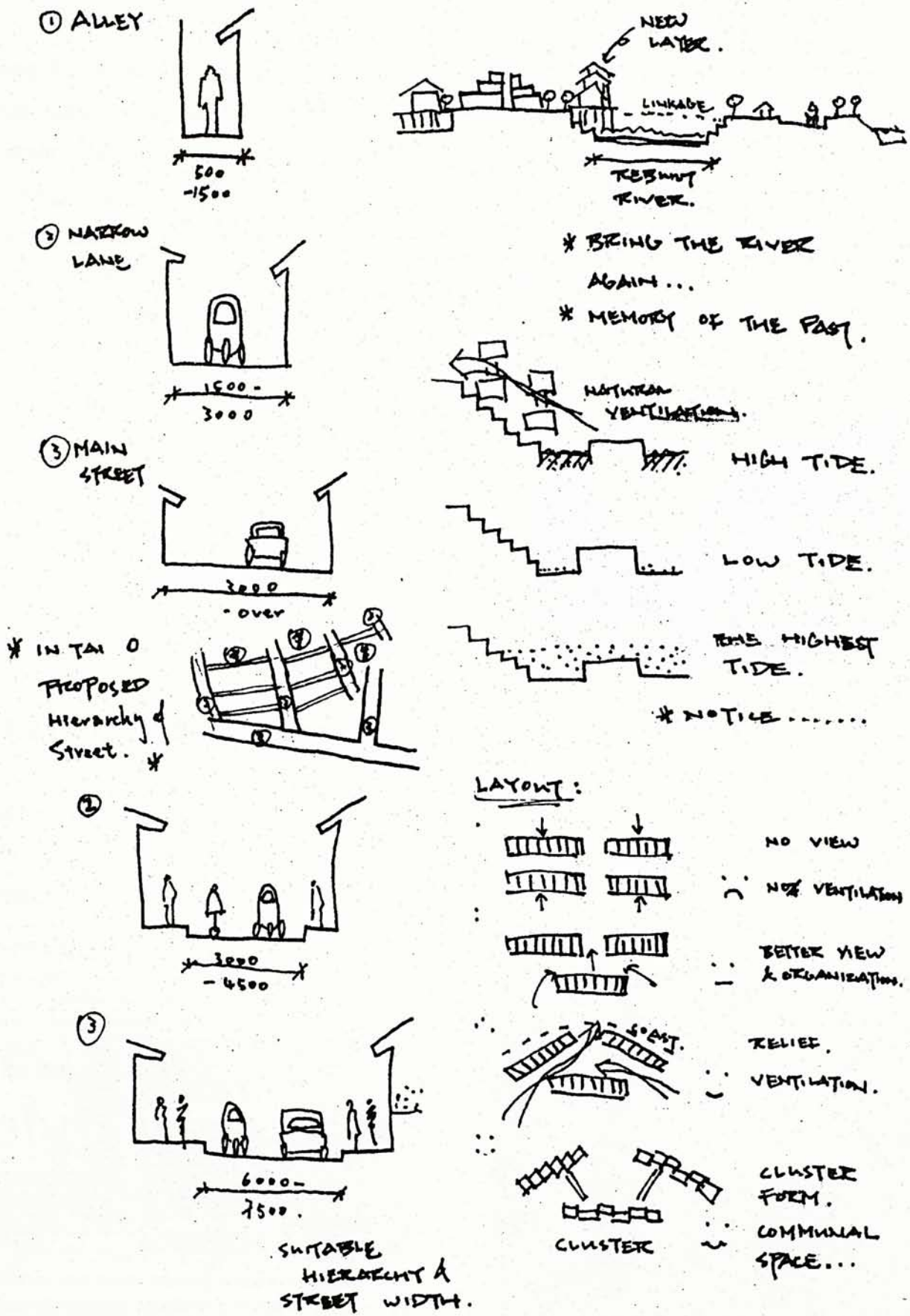
*Oblique Aerial Photograph of Tai O and Yim Tin (GCO/OAP, 1986/12284)*



*Oblique Aerial Photograph of Tai O and Shek Tsai Po. Much of this development has been formed on reclamation. The walls of the salt pans in the upper right of the Plate were severely damaged during the typhoons of 1983. (GCP/OAP, 1986/12277)*



3.3.3 Suggestions for Layout and Nature of Built-form

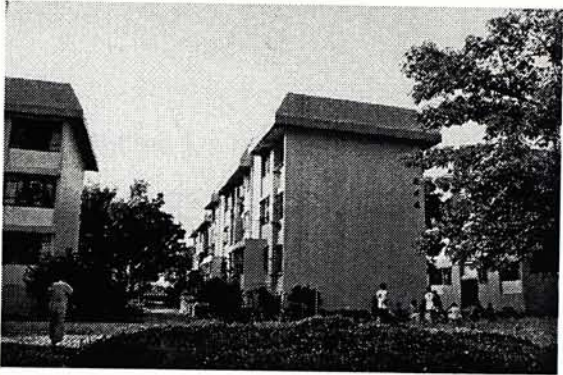




### 3.4 Lung Tin Estate

#### 3.4.1 Lung Tin Estate Phase I:

Lung Tin Estate in Tai O was the first Rural Housing project (RPH) introduced in 1973 undertaken by the Housing Authority. It provides **184 flats** (for 685 residents), comprised a market / shop units and ancillary GIC facilities was completed & occupied in 1980. There are 7 housing blocks. They are linear in shape of **3 storeys high**. The existing market stall and shops units are unoccupied, people do not prefer to buy things there. The market will be transformed into a kindergarten & a home-help service centre. The shop units will then change into a community activity centre, such works will be incorporated in Lung Tin Estate Phase II.



View for Phase I

#### 3.4.2 Lung Tin Estate Phase II:

It is located to the east & west of the existing estate Phase I. It is approximated 2.13ha. gross. It is composed of 6 blocks of varying heights, ranging from 6 to 12 storeys. There are altogether 550 flats for 2,000 people.

### STANDING TALL

New public housing on Tai O stands empty, as village residents cling to their traditional stilt homes and, in some cases, their livelihoods. The government, however, persists in modernizing the tiny island off Lantau.

**LIFE IN HONG KONG**

By SAMANTHA MARSHALL  
and reports  
On the outskirts of Tai O, a tiny island village off south-western Lantau Island, the buildings of Lung Tin Estate stand empty, a rare sight at Hong Kong's public housing projects.

Despite pleas from the government, denials of the stilt houses that have given the fishing village the moniker "Venice of the East" refuse to move to the pristine flats, some of which are more than 10 years old. Slowly, a few villagers from the corners of Tai O have moved into the first phase of flats. But the hard core have dug in at their old homes.

"My job is very difficult," sighs

David Lee, the Regional Council's district liaison officer for Tai O, whose duty it is to convince villagers they would be better off in an apartment block. The young sit, or stilt houses, are too delicate, he says. Mr. Lee fears they will be flattened or flooded in a typhoon. Besides, he says, "technically they are illegal structures."

Most of the stilt houses have yet to be hooked up to running water and, because these dwellings are in the way, the Regional Council has yet to build a proper sewage system for the village, says Mr. Lee.

"It's not very hygienic," he says, wringing his nose. Sewage goes straight from pang uk to the tidal bed. If he continues promoting the comforts of the "nice, new flats" of Lung Tin, Mr. Lee reckons, the Tai O villagers will come around.

"No way," says Cheung Kwok-chi, whose family has lived in Tai O for generations. "This is what people are used

to, so why should they change?"

Mr. Cheung, a shrimp-paste factory owner, doesn't occupy a pang uk himself, but his grandfather did. And those houses, he says, are what makes his village special. "I can't think of any way to improve it."

Tourists, a major source of income for the village, seem to agree. On a recent holiday weekend, hundreds of Hong Kong and overseas visitors thronged the narrow footpaths, photographing and gawking at the odd little stilt structures that line the coast. "Oh, isn't that charming, they even have air conditioners," one tourist exclaims.

The original huts were less idyllic, recalls Mr. Cheung. When their boats were no longer seaworthy, fishermen dragged them to shore and assembled primitive houses out of their remains. Over the generations, villagers have modernized their stilt homes, covering them with scrap metal pulled from aging sampans. Many of the pang uk now sport television aerials, frilly curtains

However, the public housing is not too successful to attract the existing residents to move in because the residents like their own community and the rent is much higher in public housing.



Lung Tin Estate, Phase II



## 3.5 Constraints

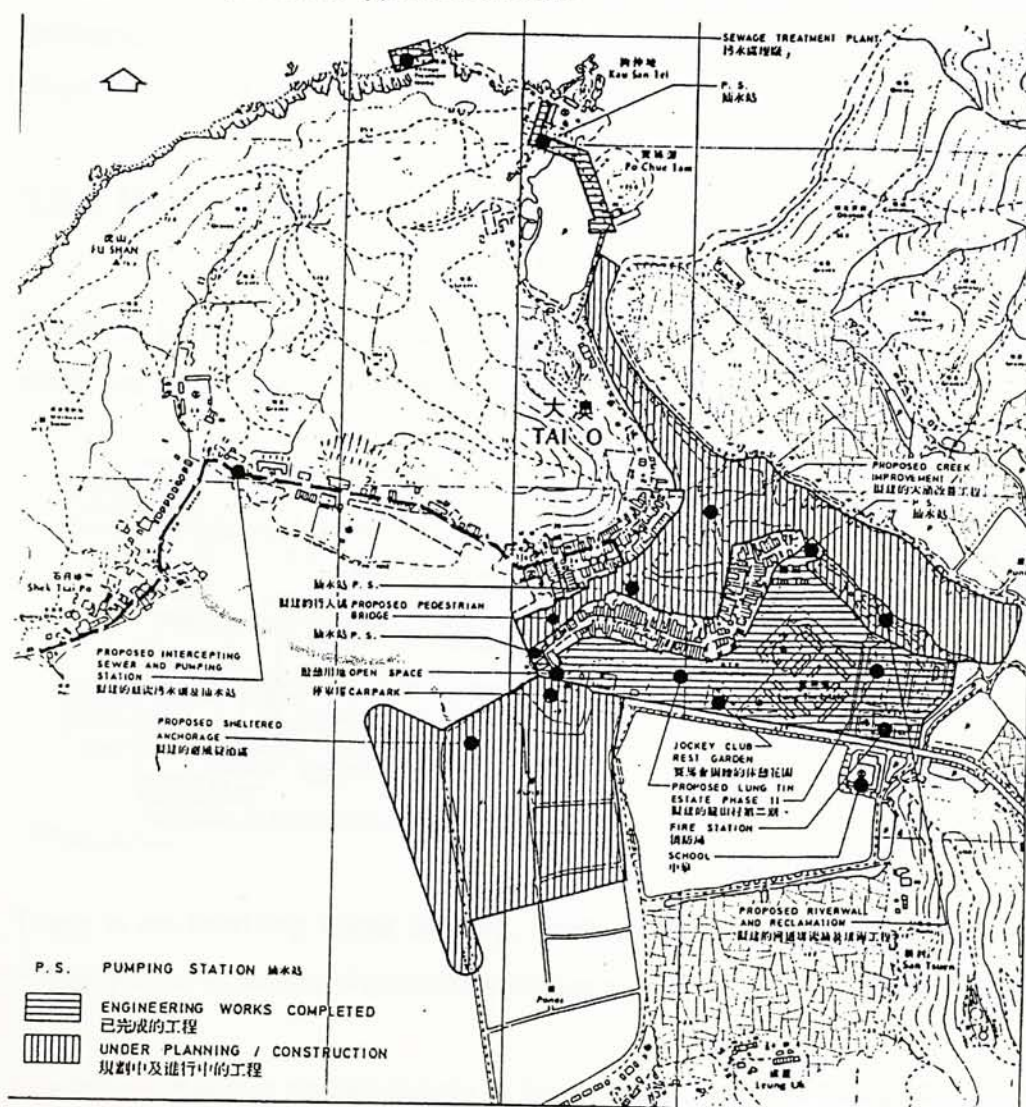
### 3.5.1 Owner of land / Existing property

**Village house:** These are owned by local villagers. They only need to pay a few dollars as crown rent to the government annually.

**Peng House:** These are under licensed conditions from the Housing authority. The Peng house owners only need to pay permit fee to the government. There has been no new permit for building new Peng house since 1990. And the transfer of existing property only restricted to closest relatives, like daughter and son, brother and sister.

### 3.5.2 Zoning Conditions

Tai O has no statutory Outline Zoning Plan. Under the last Outline Development Plan in 1988, Tai O is divided into 6 major land-use zones including sewage treatment, the industry zone and the development of typhoon shelter.

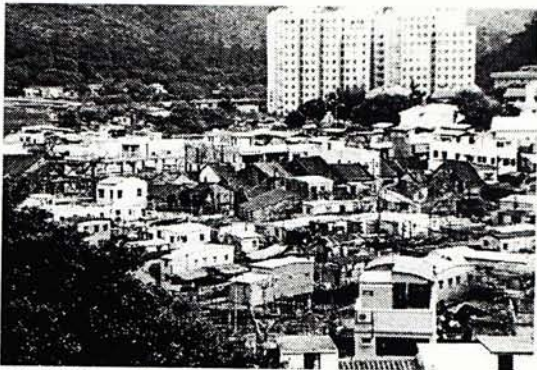


Future Development & Zoning in Tai O



3.5.3 Lease, Height and Shadow Restrictions

The lease conditions of village houses are similar to that of the New Territories. The structure is limited to 3 storeys, not higher than 8.23m on lots of maximum 65.03 sq.m. each.



Old Village Huts & Public Housing

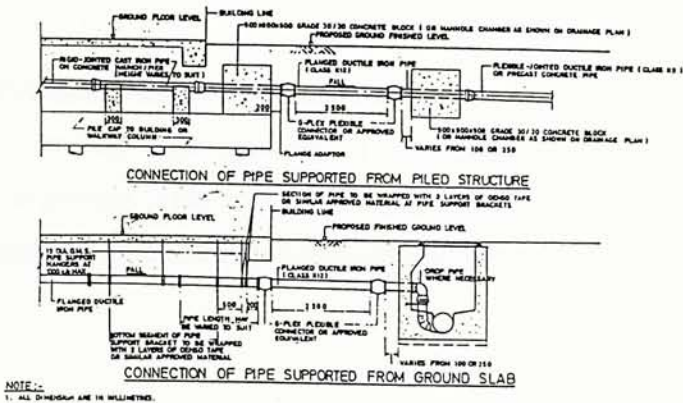
3.5.4 Foundation and Drainage

As the site was reclaimed on 20-30m thick marine mud. The pipe foundation has to be laid 60-70m deep on to bedrock.

Furthermore, flexible connection for drainage pipes are employed. In addition, within 6m of the drainage reserve is designated as non-building for the interests of the embankment's stability. Thus, the vehicular route is put here.

3.5.5 Main Services:

In the old lease, each individual village house has to build its sewage treatment tank. The foul water has to be treated before drainage into the river.



Nowadays, the **sewage treatment plant and the pumping stations** have been built to serve the new village houses and the housing estates. However, the Peng house still rely on the river for drainage purpose.

There is **no flushing water supply**. Flesh water is used for flushing means. But in Lung Tin Estate Phase II, an underground water pump is installed to get underground water for flushing.

In addition, there is no gas supply in Tai O. Only Lung Tin Estate Phase II has **a in-house LP gas supply piping system**. Others have to buy its LP gas bottle from the village.



## 3.6 Housing Problems and Opportunities

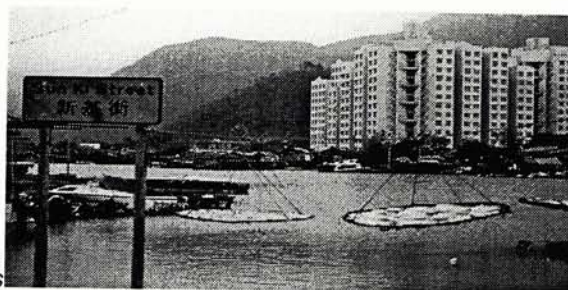
### 3.6.1 Problems from the past experiences

In the past experience, resettlement is always done by the Hong Kong Housing Society /Authority as the government removes or improves the living condition of the slum areas or villages which have potential to develop. The existing community would be break down into the standard housing estates. In such case, the community has not existed again and cannot be rehoused any more...

The followings are the problems...

#### **Basic needs are established but cultural background is not considered...**

Quite often, in public housing a standard dwelling is used to house all sizes of families with different cultural backgrounds. These dwellings do not take into account the socio-economic characteristics of the occupants.



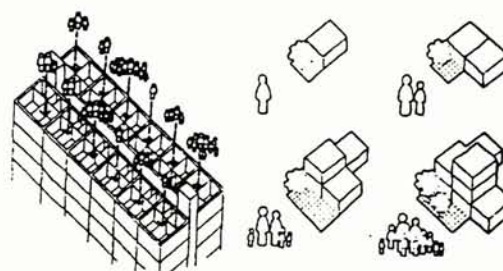
*New public housing vs traditional lifestyles*

#### **Lack of identity...**

Stereotype mass housing lacks vitality and inhibits individual identity. The current building practices discourage any attempt by the user to modify the unit to suit his needs and enhance his individuality.

#### **Inappropriate open spaces...**

Whenever open spaces are provided, they are not appropriately designed to suit the needs of the people. This lack (or at times over-provision) of open spaces discourages the social, cultural and economic activities which can take place there.

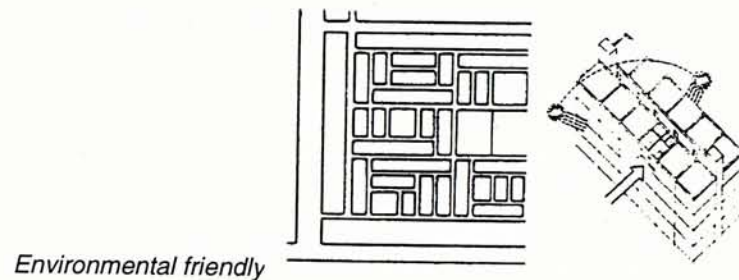


*Use of Open Space*



### **Disregard of climate factors...**

Climate is an important factor affecting site layout and building design. The built form of new developments generally ignore these factors when considering the orientation and the nature of the built form.



*Environmental friendly*

### **Income generating activities are not integrated into housing schemes...**

The design of any housing development, particularly for the lower income groups, should be flexible enough to suitably accommodate them. Most planned housing disregards this fact, and small scale income generating activities spring up in various locations in an improvised way.

### **Lack of informal character...**

Most of the planned developments are very monotonous and rigid in terms of spatial organization. The informality and flexibility which has permitted changes and growth within the traditional urban fabric are no longer seen in new housing developments.



*Typical character of modern housing*



### 3.6.2 A New Outlook: Changes in Housing Policy

As a result of the past experience, a new outlook to housing has emerged and, with that the corresponding changes in policies have also occurred. In the programmes related to resettlement, the emphasis has shifted towards **environmental improvement** from just clearance and relocation.

The government's approach to housing should also not be a constructivist one **as slum upgrading programs often fail**. With limited resources, the public sector would do well by focusing more on indirect methods affecting the housing supply. Providing access to finance and serviced land through legislative measures is a more effective mechanism to tackle the situation as compared to direct involvement in housing construction. Housing is seen more as a **process** rather than as a **product**.

Furthermore, it is also fully in understanding that the **nature, amount and distribution of open spaces in various hierarchies, based on density and the people's social, cultural, economic characteristics**. It helps to build the standards of open spaces to be provided in the design of human settlements. However, to a larger extent, the chaos in urban areas is the result of the **lack of a philosophical backbone** to the planning process adopted. Hence, these plans are subject to forces which a planner can **neither control nor direct in a meaningful way**.

In such situation, Community Development Committee of Housing Society forms to find out the best solution for the resettlement of the existing community in Tai O in the continuation of traditional lifestyles as slum upgrading program can't occur.



## Chapter 4 Project Programme

### 4.1 Mission

#### 4.1.1 User mission

#### 4.1.2 Architect mission

### 4.2 Goals

### 4.3 Special Issues

### 4.4 Schedule of Accommodation

### 4.5 Bubble Diagram of Spatial Relationship

### 4.6 Design Strategies



## **4.1 Mission**

Due to dilapidation & health problem of the stilt homes -- "Peng Houses", the residents from stilt houses are resettled. In such situation, Community Development Committee of the Housing Society would like to rebuild a communality for such spirit of unique community in Tai O by resettlement and re-plan this region as a sustainable development for further growth.

### **4.1.1 User mission**

To improve living quality of Tai O; to keep the spirit of community; and the sense of the belonging...

### **4.1.2 Architect mission**

To design a new system for Tai O -- such unique community for resettlement of existing residents and to make it sustain...

## **4.2 Goals**

It is important for any plan to have a strong ideological basis. A sense of continuity of fundamental values of the society should be the essence of the approach to plan a good habitat. The goals of resettlement project of Tai O Stilt Homes are:

### **Vitality:**

To create a communal form which at various levels supports its vital functions, the biological requirements and capabilities of human beings.

### **Imageability:**

To achieve have a settlement character that can be clearly perceived and mentally differentiated. This dimension leads to establishing harmony between the built environment and cultural constructions.

### **Flexibility:**

To evolve a framework within which progressive development can occur with ease and efficiency.

### **Efficiency**

To evolve a communal form that optimizes all resources - physical, natural and human, to the advantage of the community, so as to facilitate its activities.

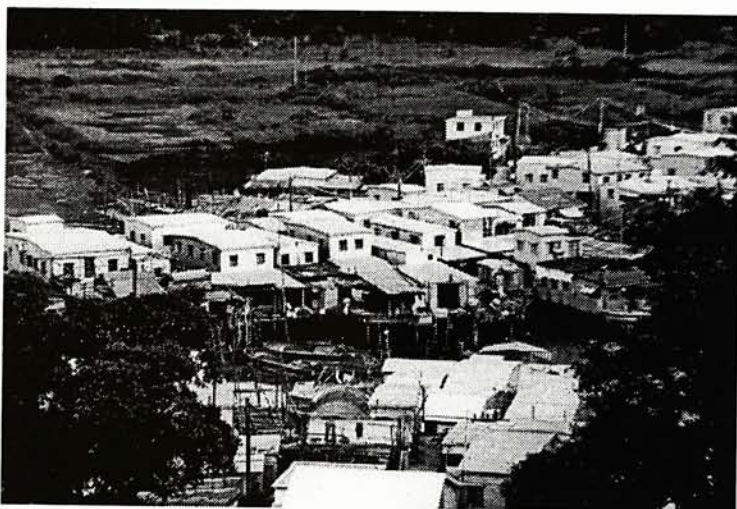


## 4.3 Special Issues

There are several special issues are considered below.

### **Indigenous Character of Built-form Suitable to the Lifestyle:**

Indigenous character of built form provides a setting for the continuation of fundamental values of society. In traditional Chinese fishing village, the level of publicness and the degree of privacy is maintained through a spatial order. The clarity of spatial hierarchy enhances the imageability of these traditional villages. The waterfront low-rise built form, comprising narrow streets and open spaces, responds well to the hot-humid climate. The oriented character of relaxed informality provides enough flexibility to suitably accommodate various economic and social activities.



*the level of publicness and the degree of privacy is maintained through a spatial order. The clarity of spatial hierarchy enhances the imageability of these traditional villages.*

### **Site and Services -- An Innovative Approach:**

As only the basic building cores are provided on services plots, the built form can be extended by the occupants at a pace in tune with their capacity to mobilize resources. Thus, the emphasis should be on providing building materials, technical know-how, finances and simple building regulations which can be adhered to.

### **Reconsideration of Norms and Standards:**

In site and services projects, economy plays a vital role. The conventional norms, standards and building bylaws followed since the license are marked and the rules are applied by the Hong Kong Government, e.g., standard size, height and material for each Stilt Homes. There is need to evolve new standards which are relevant and affordable in the present socio-economic and technological context.



### Hierarchy and size of communities within a settlement:

In a settlement design, the hierarchy and size for certain communities should be considered for 5 level -- Village level, Functional level, Community level, Cluster level and Dwelling Unit level. There is a check list for the detailed guidelines of a settlement:

<b>Settlement Structure</b>	<ul style="list-style-type: none"><li>• Size and hierarchy of settlements</li><li>• Spatial definition and boundaries</li><li>• Population structure and composition</li><li>• Relationships to other settlements and amongst various hierarchies within itself</li></ul>
<b>Settlement Design</b>	<ul style="list-style-type: none"><li>• Suitable relationship amongst density, building design, cost and environment</li><li>• Road network</li><li>• Open space system</li></ul>
<b>Supportive Facilities</b>	<ul style="list-style-type: none"><li>• Nature and magnitude of facilities</li><li>• Location of facilities</li><li>• Provision, growth and change in facilities</li><li>• Nature and levels of utilities</li></ul>
<b>Legal &amp; Organizational Structure</b>	<ul style="list-style-type: none"><li>• Forms of tenure</li><li>• Need and type of local control</li></ul>

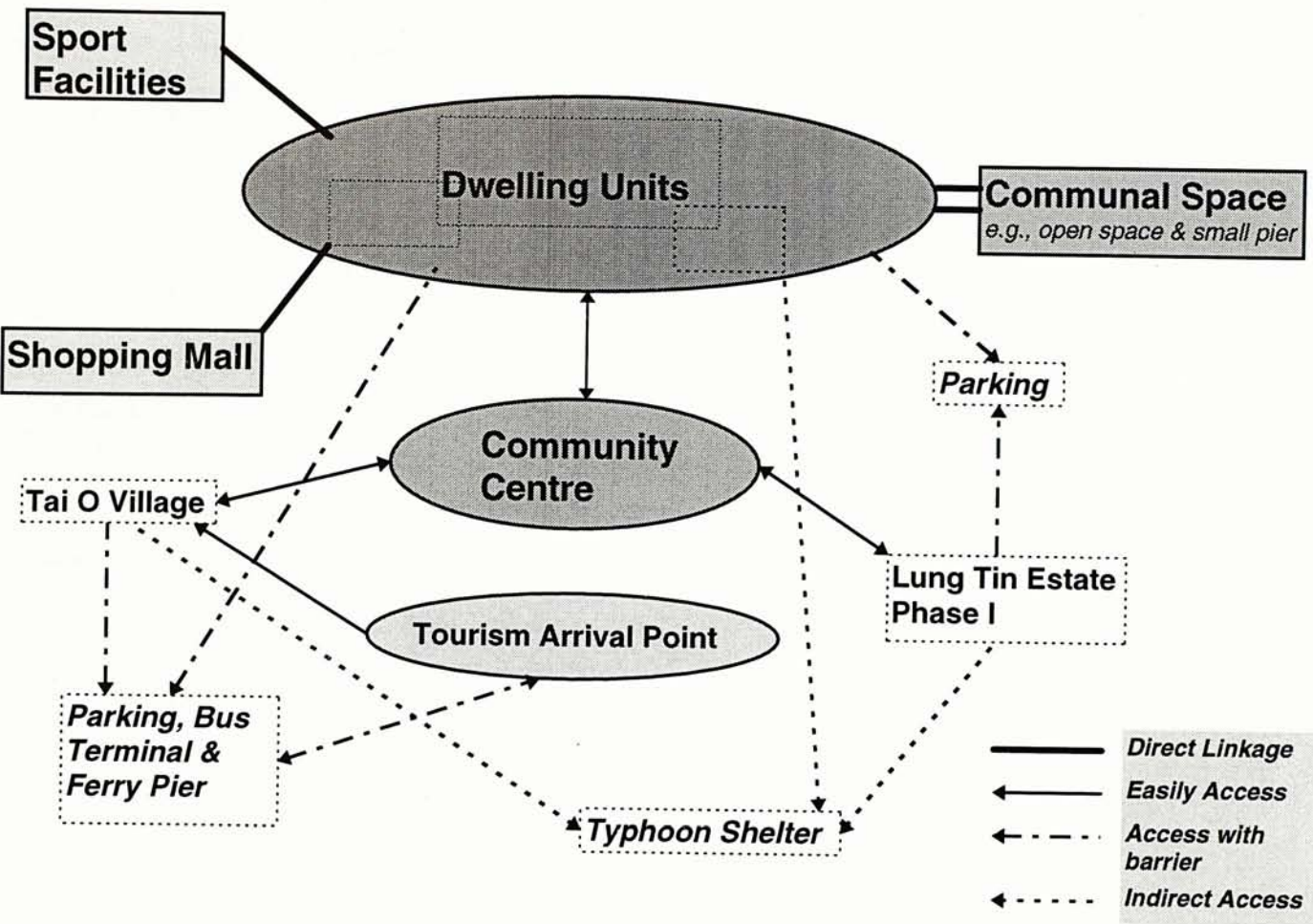


## 4.4 Schedule of Accommodation

Building Type	No. of Flat	User	Area (m <sup>2</sup> )
Housing block	100 Two-person Rm.	1-2	18x100
	120 Five-person Rm.	3-4	33x120
	90 Seven-person Rm.	4-5	40x90
	50 Eight-person Rm.	5-6	48x20
	20 Nine-person Rm.	6-9	56x20
	380 units (total)		
Carpark	360 Cars		3x5x360
Community Centre	1 Hall	100	10x10
	3 Activities Rm.	50	5x5
	1 Meeting Rm.	15	8x4
	1 Office	15	4x5
	1 Library	50	5x8
	Toilet	50	5x8
	Car park	10	3x5x10
Open Space	1 Basketball Field	20	100
	2 Table Tennis Table	4	25
	1 Children's playground	40	100
	1 Jogging Track	50	200mlength
Service facilities	Transformer Room	2	12x2
	Refuse Room	8	4x8
	Refuse Chamber	2	10x2
	Switch Room	8	5x8
	Meter Room	8	4x8



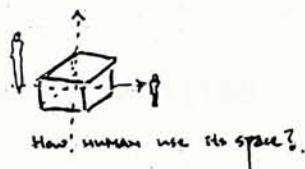
4.5 Bubble Diagram of Spatial Relationship





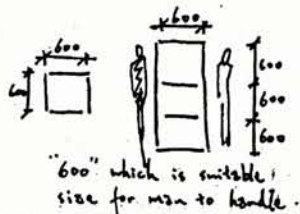
## 4.6 Design Strategies

It is not just spatial aspects, but also the aspects about residential and activities structure....



In such case, we set up a system which can be followed by the residents flexibly and efficiently.

In it, we set up 600mm grid at the standard module for the constructive elements.



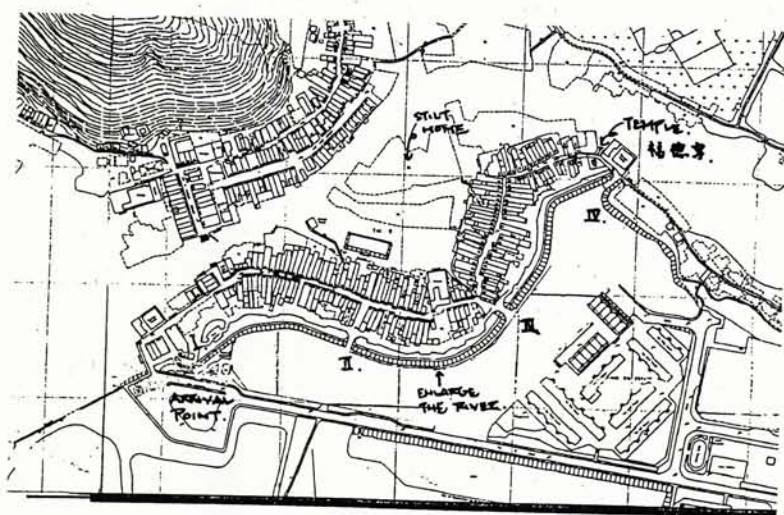
About structure, we set the mixed grid.

2700 x 3600, "2700" use as the service core/zone for the kitchen & toilet.

"3600" use for living room & bedroom...



- Variation... use "600" elements to fit in the "2700" & "3600" system.
- Concept:
  - Setting up a framework and construction elements. (prefabricated)
  - To study the structure of the residents.
  - To create the pattern and mixture for the different need.
  - To let them have their own style & individual needs.
  - To create a atmosphere for communication and the community.
  - Framework, organization, open space, communal space, linkage % new & old system as one....



\* FOUR LINKAGE.

- I. PUBLIC PATH.
  - TOURIST ROUTE.
- II. SEMI-PUBLIC.
- III. PUBLIC PATH FOR RESIDENTS
  - LINKAGE % 'NEW' ESTATE & EXISTING VILLAGE.
- IV. SEMI-PUBLIC ZONE FOR RESIDENTS
  - BIRTHDAY OF FUK TAT KUNG.



## APPENDIX

### I. Population in Tai O (1981 & 1991, Census)

### II. Precedent Studies

- Masterplan, Ayr, Scotland
- Aranya -- Planning and Design of Low-cost Housing Project at Indore, India
- "documentaciona urbana", Kassel

### III. Neighbourhood Town

### Bibliography



I. Population in Tai O (1981 & 1991, Census)

Age	Male		Female		% of population		
	1981	1991	1981	1991	1981	1991	H.K. 1990
00-04	220	88	184	72			
05-09	190	127	267	128			
<u>10-14</u>	<u>346</u>	<u>133</u>	<u>383</u>	<u>136</u>	<u>30.8%</u>	<u>24.2%</u>	<u>21.5%</u>
15-19	316	116	450	121			
20-24	110	37	199	41			
25-29	141	70	141	56			
30-34	107	66	101	73			
35-39	70	81	86	87			
40-44	89	76	92	82			
45-49	89	73	123	64			
50-54	126	84	190	57			
55-59	113	103	110	94			
<u>60-64</u>	<u>113</u>	<u>94</u>	<u>175</u>	<u>109</u>	<u>56.9%</u>	<u>56.1%</u>	<u>70.0%</u>
65-69	80	91	138	109			
70-74	64	63	113	74			
<u>75 and over</u>	<u>92</u>	<u>111</u>	<u>150</u>	<u>108</u>	<u>12.3%</u>	<u>19.7%</u>	<u>8.5%</u>
Total	2266	1413	2902	1411 (1484)			



## II. Precedent Studies

### Case Study I:

#### Masterplan, Ayr, Scotland

Architect

**Pankaj Patel: Andrew**

**Taylor Architect**

#### Concept:

A seafront site in the Scottish town of Ayr is the focus of an ambitious masterplan that combines **a range of uses and balances public spaces with the private realm.**

#### How the architect do:

The site's strategic importance is reflected in its history -- Cromwell selected it as the setting for the major fort in Scotland.



*Model showing how Both sea and river fronts would be developed, involving a mixture of residential, commercial and recreational facilities.*

The main aim of the masterplan is to reconstitute the urban fabric at **both an architectural and economic level.** The framework envisages a range of residential, recreational and commercial uses, interspersed with a hierarchical sequence of public and private space.

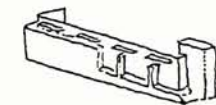
Points of activity form spaces of animation throughout the scheme and a series of

connections at an appropriate civic scale link use, form and landscape with town.

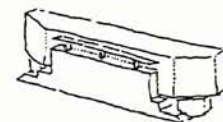
Building forms reinforce the planning strategy and permit a variety of typologies to develop around the public spaces. These include **terraces** which reinforce the linear nature of the adjacent streets, **towers** which create landmarks connecting with the river bank and beyond, and **gateways** which form entrances and delineate the more private vennels.



villa



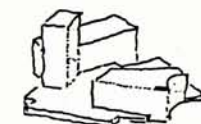
river terrace



esplanade terrace



tower



landmark building



house

#### What I learn...

1. The organization of the public space and private realm
2. the use of the architectural element as the urban fabric



Case Study II:

Aranya--

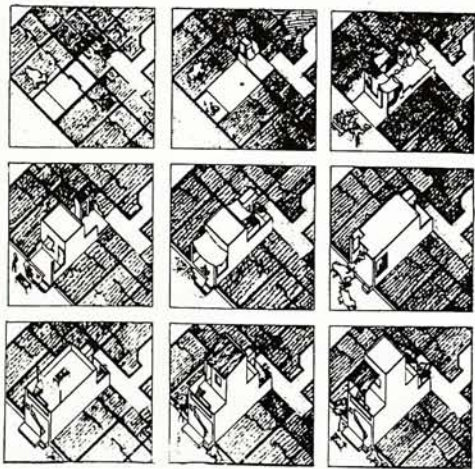
Planning and Design of Low-cost  
Housing project at Indore, India

Architect

Balkrishna V Doshi

Concept:

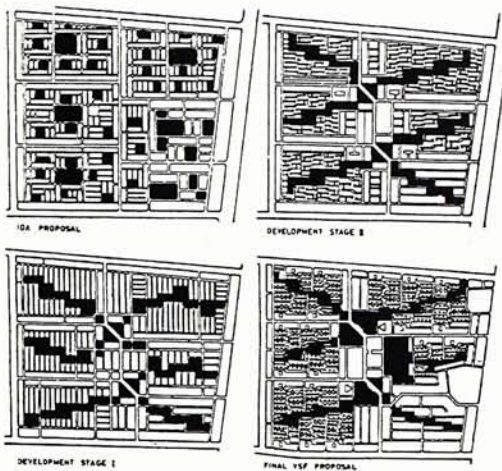
The main concept is the “site and service” approach. Each family is provided with small plot which is serviced with a water tap, storm water drainage, a sewerage connection and a paved access with street lighting. **The level of servicing varies with the beneficiary’s ability to pay.** Similarly, the plot may be supplemented with core housing, comprising of latrine and a water tap as a minimum, and a multi-purpose room, wash area and plinth as additional built-up area.



Incremental House Construction

How the architect do:

The prime objective of the project is to create an integrated human habitat suited to the lifestyle and cultural background of the people. This qualitative objective is to be achieved efficiently in order to match the affordability of the users.



Variation in street Organizational alignment

The net site area is the starting point in the planning process. An iterative process of decisions on the size and type of housing, standards of community facilities and roads, reflecting quality and area implications, is followed to satisfy the twin objectives of **affordability and marketability**. The check-list of considerations cover not only spatial aspects but also the aspects concerning the residential and activity structure. This established the framework for qualitatively improving the built environment in a manner which also took into account the corresponding physical, functional, technological and financial nuances.

What I learn...

- 1. The approach to settlement design
- 2. The process to make the design for fulfilling the lifestyle and cultural background of the existing community.
- 3. The beneficial balance for the different parties in different economic factors

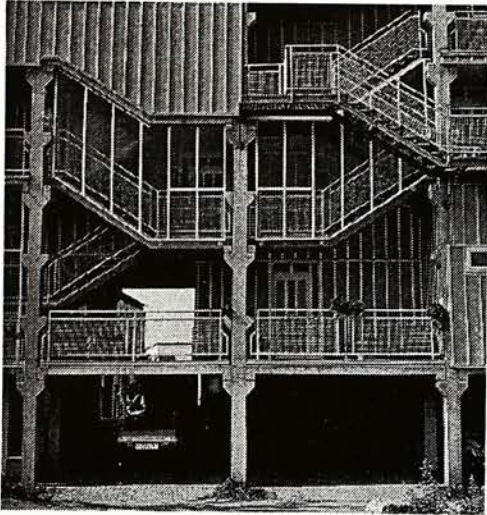


## Case Study III

### Housing with External Circulation, “documenta urbana”, Kassel, 1979-1982

Architect

Otto Steidle



*View of the stairs and pathway*

#### Concept:

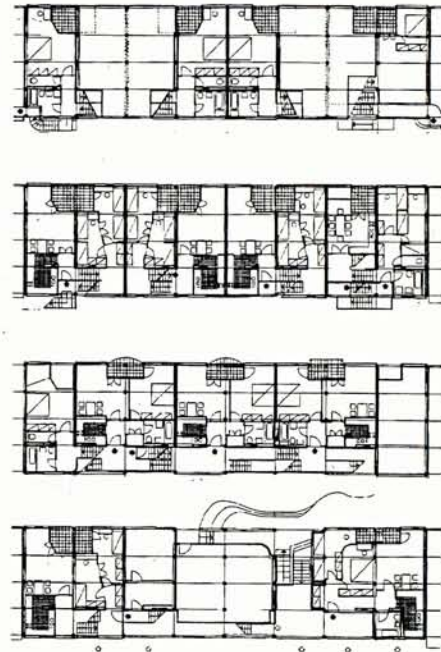
The **communicative element** represented by the circulation areas, paths and public areas leading to the private apartment has always taken on particular importance.

#### How the architect do:

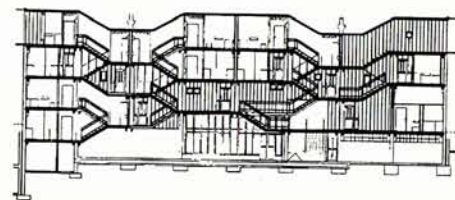
In this project, the architect placed a series of steps and walkways in front of the building, as a kind of **semi-public extension** of the pavement which is an area for encounter and experience for residents, visitors, neighbours and the public.

The walkway is planned as a kind of open pathway leading upwards. The stairs, made of prefabricated concrete elements, rise evenly outside and inside the apartments. Longitudinally the apartment levels are **half a storey higher or lower**

than the walkways and steps lead down or up to each apartment. The end of the path links in to the neighbouring buildings. In this way this communication area becomes an experience in which the neighbours can also share.



*Plans*



*Section*

#### What I learn...

1. The staircases and walkways as communal space
2. Construction of prefabricated concrete elements
3. The organization of dwelling units in half a storey higher and lower



III. Neighbourhood Town:

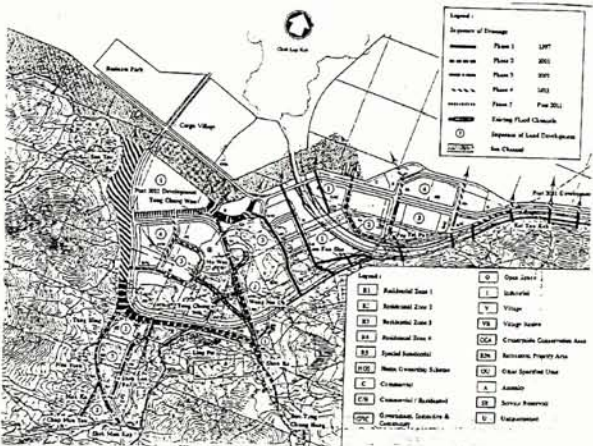
Tung Chung New Town

As part of the Government's Port and Airport Development Strategy, Tung Chung will be developed into a New Town to provide a community with residential, commercial government institutional and community development to support the new airport at Chek Lap Kok.

The first phase of the development, which will tie in with the opening of the New Airport at Chek Lap Kok in 1998, will accommodate a population of 20,000. This planned population will steadily rise to 210,000 by 2011 and possibly to 260,000 in later years.

Phase II development will accommodated a population of about 40,000, of which 33,000 will be accommodated in the housing development targeted for completion in 2002.

Estimated travelling time is **about 15 mins.** between Tung Chung and Tai O by 'flying boat'.



Tung Chung New Town Development

Mui Wo

Mui Wo has developed over the years as an agricultural and fishing community. In recent years, it acts as the gateway to Lantau Island and becomes a popular recreational area.

The population of Mui Wo is about 5,000 and is expected to increase to 6,000 in the early 2000s when most of the new development proposals will be completed.

Estimated travelling time is **about 35 to 40 mins.** between Mui Wo and Tai O by bus as the road is improved.



## Bibliography

Balkrishna V Doshi (1990), "*ARANYA-- An Approach to Settlement Design*", Vastu-Shilpa Foundation, India, March 1990.

Brian Yamaguchi Sullivan & Elmer Olaer (1994), "*A summary of Hong Kong Building Regulations which affect Housing*", Department of Architecture, the Chinese University of Hong Kong, Hong Kong.

Brian Yamaguchi Sullivan, "Inhabiting Public Housing In Hong Kong", Department of Architecture, the Chinese University of Hong Kong, Hong Kong.

Florian Kossak (1994), "*Otto Steidle -- Structures for Living*", Artemis, London

Harald Deilmann, Jorg C. Kirschenmann & Herbert Pfeiffer (1973), "*Wohnungsbau - The Dwelling - L'habitat*", Karl Kramer Verlag stuttgart, Germany

Paul Theobald(1945), "*Walter Gropius Rebuilding our Communities*", Institute of Design, Chicago.

"*Peng House in Tai O*" 1985, --Site Visit Report, Department of Anthropology

Worldwide web of Hong Kong Government -- <http://www.info.gov.hk/info/swd.htm>  
<http://www.info.gov.hk/hd/hkhaa/haaintro.htm>  
<http://www.info.gov.hk/censtat/hkinf/keypop.htm>

*Architectural Review*, "*Reclaiming the Citadel*, June 1996, P.80-82," , London

*Director of Social Welfare, 1993-1995*, Departmental Report, Social Welfare Department, 1995

*GASP Report XI: South Lantau*, Geotechnical Control Office, Civil Engineering Services Department,

*Hong Kong 1994 -- A Review of 1993*, the Government Printer, Hong Kong

*Hong Kong 1995 -- A Review of 1994*, the Government Printer, Hong Kong

*Hong Kong 1996 -- A Review of 1995*, the Government Printer, Hong Kong

"*Long Term Housing Strategy -- a Policy Statement*", April 1987, the Government Printer, Hong Kong

*Residential Care Homes (Elderly Persons) Regulation* under the Licensing Office of Residential Care Homes for the Elderly (LORCHE)

*Hong Kong Planning Standards & Guidelines*, Chapter 3, Community Facilities

## Acknowledgement:

Specially thanks to:

- **Mr. C.F. Fung -- Architect of the Housing Authority**
- **Miss M.Y. Woo -- Planner of Territory Development Department, Hong Kong Island & Islands Development Office**
- **Dr. Chan Kin Man -- Lecturer of Department of Sociology**
- **Miss Joyer Chan -- Tutor of Department of Anthropology**
- **Miss Wong Wai Ping -- Resident of Lung Tin Estate, Phase I**

& Tai O residents who give me much speech information about Tai O



## Schedule of Work

		Problem Identific ation	Site analysis	Architec tural Precede nt	Final Program ming	Master Plan Options	Model Making	Concept ual Design Options	Design Develop ment	Final Design Proposal	Preparat ion of Presenta tion
03	22/ 09	Brain Storm									
04	29/ 09		Site Visit								
05	06/ 10			Case study							
06	13/ 10				Topics Options						
07	20/ 10					Ideas Work					
08	27/ 10				Review 30/10						
09	03/ 11						Site Model				
10	10/ 11										
11	17/ 11					Review 22/11	Study Model	Options Work			
12	24/ 11										
13	01/ 12										
14	08/ 12							Review 13/12	Scheme Work		
15	15/ 12			Field Trip							
16	22/ 12										
17	29/ 12										
18	05/ 01								Review 08/01		
19	12/ 01										
20	19/ 01										
21	26/ 01								Review 27/01		
22	02/ 02									Record Work	
23	09/ 02						Study Model				
24	16/ 02								Review 17/02		
25	23/ 02										Draft Set
26	02/ 03						Final Model				Work Out
27	09/ 03										
28	16/ 03										
29	23/ 03									Final due 18/03	
30	30/ 03										
31	06/ 04								Special Studies		
32	13/ 04										
33	20/ 04										
34	27/ 04								Studies due		Work out

### Note:

30/10 First Review  
 22/11 Second Review  
 13/12 Third Review  
 08/01 Fourth Review  
 27/01 Fifth Review  
 17/02 Sixth Review  
 18/03

Organization & Zoning Period  
 Conceptual Period  
 Schematic Design  
 Design Development  
 Design Development I  
 Design Development II  
 Final Project Due



## Bibliography

Balkrishna V Doshi (1990), "ARANYA— *An Approach to Settlement Design*", Vastu-Shilpa Foundation, India, March 1990.

Brian Yamaguchi Sullivan & Elmer Olaer (1994), "A summary of Hong Kong Building Regulations which affect Housing", Department of Architecture, the Chinese University of Hong Kong, Hong Kong.

Brian Yamaguchi Sullivan, "Inhabiting Public Housing In Hong Kong", Department of Architecture, the Chinese University of Hong Kong, Hong Kong.

Florian Kossak (1994), "Otto Steidle — *Structures for Living*", Artemis, London

Harald Deilmann, Jorg C. Kirschenmann & Herbert Pfeiffer (1973), "Wohnungsbau - *The Dwelling - L'habitat*", Karl Kramer Verlag stuttgart, Germany

Murotani Bunji, 1992, "PROCESS: Architecture, no. 100, -- *Renzo Piano Building Workshop: In search of a balance, Il Rigo Quarter (Perugia, Italy)*", Process Architecture Co. Ltd., Tokyo.

Paul Theobald(1945), "Walter Gropius *Rebuilding our Communities*", Institute of Design, Chicago.

"Peng House in Tai O" 1985, —Site Visit Report, Department of Anthropology

Yoshio Yoshida, 1995, "The Japan Architect, 17, 1995-1, "1994 Annual" -- "Osaka Gas Experimental Housing NEXT21", Committee for the Osaka Gas NEXT21 Project", P160-163, Shinkenchiku-Sha Co. Ltd., Tokyo.

Worldwide web of Hong Kong Government — <http://www.info.gov.hk/info/swd.htm>  
<http://www.info.gov.hk/hd/hkhaa/haaintro.htm>  
<http://www.info.gov.hk/censtat/hkinf/keypop.htm>

Architectural Review, "Reclaiming the Citadel, June 1996, P.80-82," , London

Director of Social Welfare, 1993-1995, *Departmental Report, Social Welfare Department, 1995*

GASP Report XI: *South Lantau*, Geotechnical Control Office, Civil Engineering Services Department,

*Hong Kong 1994 — A Review of 1993*, the Government Printer, Hong Kong

*Hong Kong 1995 — A Review of 1994*, the Government Printer, Hong Kong

*Hong Kong 1996 — A Review of 1995*, the Government Printer, Hong Kong

"Long Term Housing Strategy — a Policy Statement", April 1987, the Government Printer, Hong Kong

Residential Care Homes (Elderly Persons) Regulation under the *Licensing Office of Residential Care Homes for the Elderly (LORCHE)*

*Hong Kong Planning Standards & Guidelines*, Chapter 3, Community Facilities

### **Acknowledgement:**

#### **Specially thanks to:**

- Mr. C.F. Fung — Architect of the Housing Authority
- Miss M.Y. Woo — Planner of Territory Development Department, Hong Kong Island & Islands Office
- Dr. Chan Kin Man — Lecturer of Department of Sociology
- Miss Joyer Chan — Tutor of Department of Anthropology
- Miss Wong Wai Ping — Resident of Lung Tin Estate.

**& Tai O residents who give me much speech information**

Advanced Architectural Design Studio, 1996-97  
Design Report







# ARCHITECTURE LIBRARY

## 建築學圖書館

All items on loan are subject to RECALL.

所有借出項目均會受到催還。

30-day or longer loan periods are subject to shortening by Recall. The new due date will be shown in your Library Online Catalogue circulation record and in a Recall Notice to you.

三十天或以上的借期會因催還而縮短。新的還書日期將顯示於您的圖書館線上目錄之借書紀錄及發給您的催還通知。

### DUE DATE 還書日期

(reference only 僅供參考)

Display until	1 5 AUG 2011	
	4:32 pm	
- 7 MAY 2008	- 7 NOV 2012	
- 5 FEB 2009	4:58 pm	
- 4 NOV 2009		
2 4 JUN 2010		
- 8 NOV 2010		

CUHK Libraries



003587704